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Telephone Service Essential To Progressive Farm Home

APPRECIATION of vast changes in economic and social life of rural America the basis for understanding of rural telephone problems. New sales appeal needed along with the cooperation of farmers of the country. Rural telephone progress closely identified with general advancement of agricultural community

By J. D. HOLLAND

RURAL AMERICA occupies the center of the stage in national affairs as never before in the history of the United States. Legislators and leaders of the country have come to realize, in recent years, that upon the solution of the acute problems of the farm and rural community depends the prosperity of our country. Our industrial progress and our agricultural well-being must go hand in hand; one cannot long hold the advances made, if the other has not also prospered.

The telephone was the first of modern inventions to break the isolation of rural life, antedating by many years the introduction of the automobile and radio. For several decades it played a vital role in the life and commerce of the rural community. It was considered well nigh indispensable to the rural household.

Then came the breakdown in the economic status of the farm—almost throughout the entire country. This occurred some years before the general depression which descended upon the United States in 1930. Many were the causes ascribed for this condition, but of particular interest to telephone men was the resulting decline in rural telephones and a growing lack of interest in telephone communication in rural districts.

The vast changes that have taken place in the life of rural America have also had their influence upon the telephone situation. These changes are vividly pictured in a comprehensive treatise of the subject, "Rebuilding Rural America," written by Mark A. Dawber after a 20-year study of rural conditions in the United States and Canada. This book of more than 200 pages was published last year by the Friendship Press, New York City.

Drastic Changes in Rural Life

Mr. Dawber states, in his introduction, that rural America is in the melting pot of change, that it is now facing the most drastic changes in its history. The old individualism, which produced many of the sturdy characteristics of rural life, the author points out, is in discard, and a new individualism is arising—an individualism with a willingness to cooperate in the solution of their mutual problems.

The development of good roads, improved transportation and communication facilities, and, in particular, technological changes in methods of production, have brought about a new economic status in rural America in the past 15 or 20 years.

The farm home is no longer a self-contained unit. Farmers in many sections of the country have become specialists in a particular field, resulting in an inter-dependence of farmers upon one another and upon the products of the city factories. Forty years ago American farm families were self-supporting units in a large degree. They produced on the farms the essentials in the way of food, clothing and fuel, and contacts with their neighbors were largely social.

The first of many changes came when farming, generally speaking, became an industrial business rather than a domestic enterprise. The next change came when the cost of government rose to considerable proportions and taxes began to assume a major importance in the farm budget.

Then science made available to the rural home needs and luxuries such as the automobile, radio and labor-saving farm equipment; and many a farmer was tempted beyond his ability to withstand this economic pressure.

Major social changes have accompanied these economic changes. Until recent years members of the rural

population of America had lived their lives within narrow geographical limits. With the advent of modern transportation, however, the rural radius has been vastly extended. The rural community, radiating from the crossroads' trading center, the red schoolhouse and the country church, is but a memory in most parts of the country.

Group Interest Has Radius of 100 Miles

Present group interests have been set up within a radius of 100 miles, or even more. The changes have, no doubt, tended to widen the horizons of many individuals but have, in a large measure, robbed America of the neighborly association of a group of people, working together for the common welfare of all.

Even topics of conversation are affected by enlarged geographical scope. Affairs of the county seat are now of as much concern as those of the nearest hamlet.

Changes have also taken place in the social life of the rural communities. Informal neighborhood visiting, picnics, church "sociables," quilting parties and community dances have ceased or are on the wane. Those that continue are often commercialized in dance halls or movie houses of the county seat or roadhouses in the country.

Because of these disintegrating influences, the youth of rural America is restless, on the move, but lacks direction. Social workers who have given the rural problems of our nation much study and thought assert that what is needed in rural sections throughout the country is the development of a strong group interest.

We have today, perhaps, the largest rural population the nation has ever known. In recent years there has been a back-to-the-land movement, as never before in a similar period in American history. As a result some 54,000,000 people are now living in rural territory (towns of 2,500 population or less) of whom 31,000,000 are living on the farms and depending on agriculture for their living.

The back-to-the-land movement is not found in every section, to be sure. In parts of New York, Pennsylvania and New England, for instance, the present exodus is from the country to the cities or larger towns. This is due to local conditions, however.

The rural-trained worker has never been able to forget the farm. While city wages have held him in his tenement or cottage, still he has continued to dream of a home in the country, with a garden, a cow, some chickens, etc.

Tremendous progress has been made in agricultural production methods. As long as industry could absorb those displaced by modern machinery, all was well. But the tragedy of unemployment became pronounced in recent depression years when industry was unable to provide employment for the displaced workers.

There should be a telephone in every farm home. Telephone borrowing is unsatisfactory to the borrower; it results in annoyance to the one whose telephone is borrowed; and it is an injustice to the telephone company.

Conflicting allurements of industry and agriculture have created a double stream of migration—youth continually lured to the city; and hosts of others, more or less disillusioned, making their way back to the countryside.

In solving the problems of the changed rural community, the telephone can and should play a vital part, and far-sighted telephone men of the country should make an earnest study of rural conditions in the particular territory they serve.

The development of the Independent telephone industry in the United States received its greatest impetus in the rural communities of the country. It is, therefore, of much concern to thinking telephone men that many farmers of the present day should be unable to appreciate the value of the telephone, which was so highly regarded by their forefathers of a generation or two ago.

With some exceptions, telephone companies in the cities of the nation have regained their losses of the depression years of 1930 to 1933. But in the rural districts, the situation is quite the reverse.

Many farmers have come to feel that the telephone is a luxury with which they can manage to dispense. If there is a choice between an automobile and a telephone, the decision is often made in favor of the former.

Telephone service of two generations ago had an emotional appeal to rural America that is perhaps lacking today. It had for years been an unattainable prize. So when the basic Bell patents expired in 1893 and 1894, and Independent telephone manufacturers made equipment universally available, farmers in every state in the Union were most eager to avail themselves of this marvelous invention of modern civilization.

Without waiting for the extension of service from cities and towns, literally thousands of farmers throughout the land organized cooperative or mutual telephone companies, pooled together the necessary funds for material and equipment and set to work with their own hands to provide themselves and their neighbors with telephone service.

There was no telephone sales problem in rural districts in those days. The problem was to secure the necessary materials and telephones and get the lines in operation quick enough to satisfy the demand.

Today when the need for telephone communication is far greater than it was 40 years ago—with the less self-sufficient farm establishment and a far greater inter-dependence—the emotional appeal appears to be lacking. And this in spite of the fact that present-day telephone service is practically universal as contrasted with the very limited communication facilities of the early days.

Possibly a new sales approach is needed to the rural telephone problem in the face of these social and economic changes.

Telephone Today Has Different Appeal

The strongest instinct of man is self-preservation. Money in these days has become very essential to the preservation of man and his family. Thus, the pocketbook appeal is a very strong one. With the advent of the radio, the automobile and good roads, the telephone is no longer the one means of breaking down the isolation of the rural home.

It seems, therefore, that the present appeal of telephone service is its money-saving and money-making value. Each telephone call saves many miles of gasoline expense, if the telephone errand were to be transacted in person. By keeping in close touch with the markets, a

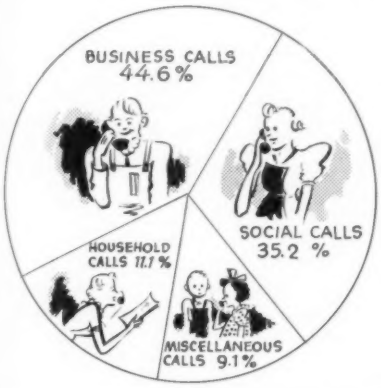
farmer is able to secure better prices for his produce—thus actually making money for himself.

Generally speaking, time is money, so the time saved by running errands by telephone actually saves a busy farmer money. A most illuminating survey along these lines was made not long ago in the state of Iowa.

Farm Survey Proves Telephone a Money Saver

This survey was made with the cooperation of 27 typical farm families, who agreed to keep a record of all telephone calls—IN as well as OUT—over a period of 10 days. The results obtained were then projected to cover a month.

When the data had been tabulated it was found that these farm families had saved an average of 19 special automobile trips per month by using the telephone to transact errands whenever possible. The total monthly round trip mileage was 171.06 per



An actual survey made in Iowa revealed the fact that the farmer's telephone is essentially a business telephone.

family or 4,620 for the entire group. The cost of driving an automobile over these 171 odd miles would have been $4.28 a month, using the conservative figure of 2½ cents a mile one-way car expense. Thus it is easily seen that telephone service—instead of being an item of expense to the farmer and his family—actually saves him at least several dollars a month in car expense.

Then, too, there are certain periods of the year when time on a farm is at a premium—when the time spent in transacting an errand in person after making a long automobile trip is valuable time lost and, therefore, money lost.

Another interesting revelation of the survey was the fact that the bulk of telephone calls are *business* calls. Of the total calls made by the 27 families participating in the survey —averaging 92 calls a month per family (44 outgoing and 48 incoming)—44.6 per cent of them were business transactions.

Not much more than a third (35.2 per cent, to be exact) were social calls; 11.1 per cent related particularly to household transactions and 9.1 per cent were miscellaneous telephone calls.

It was learned also that the wife makes 60 per cent of all calls, that the husband makes 23 per cent, and other members of the family, hired hands and neighbors, the remaining 17 per cent.

The same company which conducted this farm survey conducted a successful "three-egg campaign," in which attention was called to the farmers that telephone service cost them between two and three eggs a day at prevailing egg prices.

Another obstacle to a satisfactory rural telephone development is, undoubtedly, due to the fact that some companies—especially the farmer-owned rural line companies—have felt that most any kind of telephone service and telephone equipment would do. But poor and undependable telephone service is expensive at any price.

Telephone managers argue that rural patrons are unwilling to pay the necessary cost of first-class service. Perhaps the latter have never had a first-hand acquaintance with really good telephone equipment and service.

REA Adds to Rural Telephone Problems

The extension of electric lines into rural territory, with funds provided by the Rural Electrification Administration, has added substantially to rural telephone problems.

On the one hand, telephone companies are confronted with the problem of changing grounded lines to metallic construction to eliminate inductive interference—with or without financial assistance from the elec-

The cost of telephone service is trifling in comparison with its value—in running errands, in keeping the farm home in touch with the trading center, the market, the county agent, etc., not to mention its social, protective and emergency values appreciated by every member of the household.

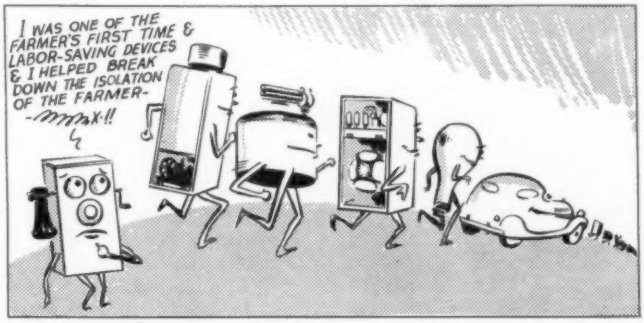
tric organizations extending their lines. On the other hand, another strong competitor for the farmer's dollar has loomed on the horizon in these rural electric lines.

There are two ways in which telephone men can take these problems. They can bow to the inevitable, rest on their oars and say:

"What's the use of trying to do anything with this rural telephone problem anyhow?"

Or they can build on the inevitable—improve or change their sales tactics and set out to convince the farmers of the nation that they need telephone service as well as electric service; that the $15 or $18 a year paid for telephone service returns many fold to them in value received in diverse ways: Business, social, for protection and in emergency uses of various kinds.

Regardless of construction methods and care in maintenance, service on grounded telephone lines is seldom as good after electric lines have been built as before their advent.



"I should be at the head of this parade. Maybe I need rejuvenation and a new dress with eye appeal."

Why not, therefore, talk up the idea of metallic telephone circuits for rural lines and get farmers to thinking about metallic circuit service with its increased dependability?

The usual rate for metallic circuits is but 25 cents a month more than for grounded line service—and that just about covers the increased cost of maintenance of the metallic circuit.

Is it not best to be in the vanguard of the march of progress?

In the last analysis, however, the problem of rural telephone service is closely identified with the economic and social problem of the rural community of the nation. The solution of the one must necessarily accompany the solution of the other, generally speaking. In fact, they are to a marked extent dependent on one another for solution.

A campaign of farmer education on the time and money-saving value of dependable telephone service is undoubtedly needed, along with an intelligent solicitation of his cooperation and fair consideration in rate matters.

Having had a vital part in first breaking down the isolation of rural America, Independent telephone men should welcome the challenge to participate in the rebuilding of rural America in the face of problems that have arisen or have become particularly acute in recent years.

This they can do by taking the initiative in helping to re-establish a wholesome community life; by sponsoring every effort that will in any way contribute to the unity and progress of a rural community; by furnishing telephone service to the farm home that is on a par with high-grade town telephone service, at the same time taking steps to secure adequate compensation for such service.

The Independent telephone man can and should remind the farmer, again and again, by means of advertising in the newspapers, local farm publications as well as direct-by-mail circulars and by demonstrations of various kinds of telephone equipment and its uses, of the money-saving and time-saving value of telephone service.

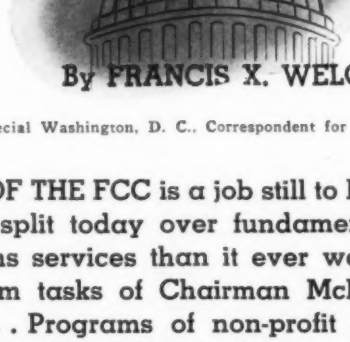
The recent broadcasts (TELEPHONY of January 29) from the radio station of the Iowa State College of talks by the secretary of the Iowa Independent Telephone Association and the debate on the telephone and REA indicate another means of reaching the farmer to discuss a matter of great importance to him.

Get him vitally interested in his communication facilities and he will undoubtedly help in promoting the use and usefulness of telephone service in his community.

It is estimated that two million American farmers are now members of one or more cooperative organizations. Why not enlist their cooperating in solving the rural telephone problem?

Cooperation is on the way in the telephone field, generally. The age of competition was succeeded 25 years ago by a "live and let live" policy. This has now reached the stage of constructive helpfulness and cooperation among commercial companies generally. And it is believed that definite steps can be taken toward a solution of the rural telephone problems if the cooperation of the farmers is solicited and obtained.

The future of the Independent telephone industry is very closely identified with the interests of rural America, especially in the great Middle West. So telephone executives and owners should keep abreast of the times and move forward with the people of the small towns and rural communities of the nation in "Rebuilding Rural America."



In the Nation's Capital

By FRANCIS X. WELCH

Special Washington, D. C., Correspondent for TELEPHONY

"CLEAN UP" OF THE FCC is a job still to be done . . . FCC membership more split today over fundamental policies affecting communications services than it ever was. . . . Some reasons why the reform tasks of Chairman McNinch have not been carried out. . . . Programs of non-profit educational agencies from new class of broadcast stations may prove interesting

"The time has come," the Walrus said,
"To talk of many things;
Of shoes and ships and sealing wax,
Of cabbages and kings."

The time has come, in short, to say a word or two about the kind of job Chairman McNinch is doing in "cleaning up" the Federal Communications Commission. The answer is, simply and bluntly, that the job is still to be done. Mr. McNinch has failed to bring order out of chaos or anything like it.

The FCC today is shot through with dissension, distrust, political recrimination, and downright schoolgirl jealousy. Its top membership is more split today over fundamental policies affecting the communication services of this nation than it ever was and, as you well know, it always has been in a rather bad way.

Now those are forthright words, but this correspondent would be re-

miss in his duty to keep readers informed of the real state of Washington affairs affecting the telephone industry if this plain talk were put off much longer. It is only a matter of at most a few weeks before it becomes common newspaper property.

IT ISN'T necessarily Chairman McNinch's fault that the FCC still remains an administration problem child. He was sent to do the clean-up job with much fanfare but little equipment. He was given a great send-off but no broom; and a broom is what he needs more than anything else.

The new chairman got off to a good start when he abolished the old inefficient tri-divisional system and fired several unnecessary major domos. It was, perhaps, an obvious step to take but nobody had taken it before, so for that reform credit must be assigned.

But there the purge stopped. You see, the trouble with the FCC can be roughly divided into two classes: (1) The political or patronage friction which infects, for the most part, the subordinate branches of the commission; (2) the deeper and much more important differences over fundamental policies of the commission, which have to do mostly with the upper strata of the commission, mainly the commission membership.

CHAIRMAN McNINCH finds himself blocked in both directions. Let him so much as threaten some subordinate not already protected by Civil Service, and some Congressman or Senator hits the ceiling, all ready to run to the White House, if necessary, to protect a faithful disciple.

Of course, Chairman McNinch stands in solidly enough at the White House to defy a certain amount of this kind of opposition. But, again, there is always the sinister spectre of a congressional investigation dangling before the chairman, which makes him rightly nervous about offending too many of the boys on the Hill.

Naturally, this is a trying and delicate situation to handle. After all, Mr. McNinch was sent over to the FCC to head off a congressional investigation at all costs. What would the President think if his good man Friday started swinging the battle ax, however justly, with the result that some Congressmen became riled enough to start the very investigation the "trouble-shooter" was sent to prevent?

And so, to invert Teddy Roosevelt's famous line, Chairman McNinch must walk heavily, speak sharply, but carry an exceedingly small stick. Even so, nobody at the FCC seems to be very frightened.

Maybe things will be different after the current session of Congress is adjourned. With Congress out of the way, Chairman McNinch will probably feel that he has more liberty of action. His present task is to sit on the lid and keep the whole works from blowing sky high until the Congress does get out of town. And maybe he won't succeed.

WHEN WE TURN to the other reform task confronting Chairman McNinch, we find that he had, and still has, an even more difficult assignment, because the conflict of policy is grounded for the most part in the sincere convictions of the individual members. It's always easier to deal with a controversy growing out of mere self-interest than one growing out of the embattled determination of righteous men. Hessians, in other words, are more easily disposed of than Crusaders.

It would be out of place here to go into the specific differences which split the FCC membership. They deal mostly with radio, but at least two points of discord which have emerged in more than whispered debate during executive sessions, or in Chairman McNinch's more frequent and informal "conferences," directly involve the telephone industry.

One of them concerns the forthcoming special telephone investigation report. The other involves the telephone industry in a more collateral but probably more significant way—in its relationship to the complete communications picture of America, including all carriers of intelligence, even airmail.

Into the center of this picture, place the administration's own appointed peacemaker. He doesn't know a great deal about the matters under consideration—admits as much. Nobody ever expected the chairman of the Federal Power Commission to pick up his hat, take a cab at 18th and Pennsylvania Avenue, and emerge a few blocks away an expert on communications. But the fact remains that between the opposing wings of the Crusaders, the peacemaker often finds himself in pretty deep water.

As far as that is concerned, there are others who have been around the commission much longer than Chairman McNinch, who would hardly be called experts at regulation or anything else. But a commissioner's job is pretty safe. As long as he conducts himself with reasonable decency, nobody can fire him—not even the President. This gives a commissioner with his own convictions considerable fortitude in meeting opposing views. Such a member does not scare easily or back down gracefully.

JUST AT PRESENT there is a bloc of three members, recently formed, in agreement on a certain policy of vital, long-range importance to the communications development of the nation. There is, of course, opposition. There will eventually be showdowns, dissenting opinions, public reaction; and people will begin wondering all over again what is the matter with the FCC. Why didn't Chairman McNinch bring peace to that troubled body?

The answer is that Chairman McNinch can't, from the very nature of things, do very much about it.

TELEPHONY-RCT
Semi-Annual Issue

This week's issue is one of the semi-annual TELEPHONY-RURAL COMMUNITY TELEPHONING issues for 1938. Twice each year, in the late winter and early autumn, TELEPHONY is sent to the 5,000 largest rural telephone systems in the United States. These 5,000 companies are reached additional to the regular distribution of the magazine.

The publishers of TELEPHONY have long felt that the rural telephone field is one of particular interest to commercial operating companies (Independent and Bell) and to all telephone manufacturers and suppliers. The telephone business is a great national and international network and as such, the rural systems are integral parts, deserving consideration and attention from all who are engaged in the telephone business.

In June, 1934, the first issue of RURAL COMMUNITY TELEPHONING, was sponsored by Telephony Publishing Corp. as a separate magazine. On January 1, 1937, RURAL COMMUNITY TELEPHONING was merged with TELEPHONY with the plan of devoting, each year, two of TELEPHONY'S regular issues to the particular problems and interests of rural companies. This issue of February 19 is the first of the 1938 RURAL COMMUNITY TELEPHONING numbers; the next will be dated September 10, 1938.

He may eventually calm some of the squalls in the subterranean passages of the commission; but when it comes to fundamental policy, he's up against a proposition that is bigger than him or any other one man.

THERE ARE doubtless times when Mr. McNinch longs for the comparative peace of his old post as head of the FPC. There he ruled the roost, and few crickets chirped when the cock was crowing. But alas, were he to return there he would find that it also is torn with a considerable degree of strife. He would have to put down another rebellion in his native stronghold. The FPC bickering is going along more quietly than the FCC differences, but it's going along—and we'll be hearing more of it any day now.

And that raises the final question of whether Chairman McNinch could get back to the FPC as easily as he went over to the FCC. It must be remembered that he would have to be confirmed by the Senate all over again; and there is a bloc of Senators, headed by Senator Bailey from Mr. McNinch's own state of North Carolina, who are mightily displeased over Federal invasion of state regulatory rights over hydroelectric sites.

This aggressive Federal policy is being carried on largely by the FPC, but it was actively instigated by Chairman McNinch when he was head of the FPC; and for that reason, if a confirmation fight ever developed, there would be a number of Senators definitely opposed to putting him back as head of the FPC.

Of course, taking a practical point of view, the administration could probably swing it for Mr. McNinch and no fight would develop. But it would cost something in terms of political remuneration to put it over; and would the change be worth the cost to the administration?

These are the thoughts which make Washington observers wonder whether Chairman McNinch, unhappy though he may be in his present post, might be well advised to stay where he is. He may not make the next trapeze with the greatest of ease.

IT WAS INTERESTING news that the FCC decided to set up —a couple of weeks ago—a new class of high-frequency broadcast stations to be licensed to non-profit educational agencies for the advancement of their educational work. The educational, cultural, and religious groups have been agitating for this sort of thing a long time and it is high time they were given a chance to see what they can do about uplifting the masses without the aid of coffee, toothpaste, or pies like mother tried to make.

The theory underlying the cultural groups is that the profit motive is often repugnant to true educational enterprise. A commercial advertiser on the radio, according to this view, will too often pander to the worst that is in public taste rather than try to improve it. There's some plausible basis for this line of reasoning, although the implication may be unfairly sweeping.

As the telephone industry is at least collaterally interested in important steps taken in an allied field of communication, it should keep an eye on the developments. Certainly the cultural groups will deserve at least sporting admiration when they try to prove their case by way of competitive broadcasts. This being a free country, they will really have to deliver the goods in order to lure an audience away from the commercial stations.

But while on the general question of whether a profit motive has an invariably deleterious effect on free education, knowledge or pure research, it might help once in awhile to forget the implications of "Arrowsmith" and consider what has actually been done in the field of education and pure research by avowedly profit-making institutions.

Commenting on the recent action of the Westinghouse Electric & Mfg. Co. in establishing ten post-doctorate fellowships for research in physics and physical metallurgy, The New York Times made some pertinent editorial observations on this point:

> In some fields of research the industrial laboratories are far in advance of the universities. Not from otologists and laryngologists have we learned very much that is strikingly new about speech and hearing, but from the Bell Telephone Laboratories. Not by the universities has light been shed on the chemical reactions that occur in the best vacuum that can be created, but from the General Electric Co.
>
> Not from some university professor did we glean our latest knowledge of surface chemistry, but from that Aladdin of the electric lamp, Dr. Irving Langmuir, with the consequence that biologists and cancer experts are now presented with an effective method of studying protein molecules and cells and hence the physics of life itself.

AND HERE'S a laugh line from London, of all places! A Washington correspondent for an English newspaper recently sent the following squib to this writer's desk:

Hereabouts lawyers come between Lawnmowers-Sharpening and Leather in the yellow pages, and none protests. It is otherwise in London. Legal honor is more subject to contamination there, or something. For the Inns of Court are, it seems, aflame and the British Bar rocks with indignation to find six hundred British barristers sandwiched between Bankers and Barrowmakers in the "classified trades" section of the new London Telephone Book.

Having got enough professional breath back, an enraged General Council of the outraged British Bar has passed a resolution demanding redress and sent it to the Postmaster-General of Great Britain. For he it was that did the dastard deed, or caused it to be done. He it was that dared so far as to make "prominent K.C.'s" trade neighbors to barrowmakers and bankers when he added a classified directory in his 1938 telephone book.

In spite of the protests of the General Council of the British Bar, in face of the universal indignation of the British barristers, the Postmaster-General is going to keep the six hundred London barristers just where he put them —after bankers and before barrowmakers in the telephone book trade directory.

Moreover, he adds insult with his reasons. He says he wasn't thinking of legal etiquette when he put barristers in the London telephone trade directory; he was thinking of public convenience and is still thinking of it. He says that there are a thousand physicians and surgeons listed in the same directory; and if their etiquette can stand it, why can't barristers'? He deliberately ignores the fact that a profession eligibly situated between physical culture and pianos can afford to waive more etiquette than bankers' neighbors can.

Wonder what back copy of our own Washington telephone directory our English friend was looking into. In this writer's edition of our local telephone book, the majesty of the law stands forth in all its splendor between Laundries and Lead Pencils. In fact, the way the law business has been going lately in Washington, some of the local barristers claim there isn't much to choose between all three titles as a means of making a living.

▼ ▼

Ohio Companies Rank Fourth in Paying Taxes

Telephone companies paid into the Ohio state treasury, in the form of operating taxes, a total of $4,791,577 during the fiscal year of 1937. Of this amount, approximately $4,786,245 represent the amount paid into the treasury by Class A companies, or those having operating revenues in excess of $100,000 for the year.

Ohio was exceeded by only three other states in tax returns, New York paying $20,201,135, the highest of any state, while Delaware was lowest with $76,913.

Improving Telephone Service In the *Rural Community*

By RAY BLAIN

EXAMINE the history of any country and you will find that its civilization has never advanced at a faster rate than the development of its communication and transportation systems. That our own civilization will probably be elevated to even greater heights is indicated by the fact that our own communication and transportation systems are being constantly improved and expanded.

The convenience, ease and speed of modern transportation have created a need for more and better communication facilities. People of the present day travel more on both business and pleasure than they did only a decade or so ago. When people have a wide circle of friends they naturally have a need to communicate with them more frequently. The telephone in this country handles the greater part of this modern communication.

Two bracket circuits which may be used to provide a phantom telephone circuit at small additional cost.

In our average rural community, especially in the more thickly-populated states, the exchanges generally average about seven to ten miles apart. Rural lines radiate in all directions from these exchanges. Numerous arrangements are in effect to provide communication between these various exchanges.

Some are on a toll basis, while others furnish their subscribers free service to several different exchanges in the system. Often this service between two exchanges is furnished over an overloaded grounded rural line with an inferior grade of transmission. Such service, even though it may be free, is of very little value when we consider the universal nature of our present-day telephone service.

A telephone anywhere, even on a rural line, may be called upon at any time to complete a call from the other side of the world. Consequently, a telephone system is no better than its most inferior line.

An inferior grade of transmission need not be tolerated in the present age, even on a rural line, when corrective measures can be obtained at such a reasonable cost. By corrective measures is meant any improvement, such as metallicizing lines, proper transpositions, and the use of loading coils and vacuum tube type repeaters. An increase in rates usually follows the making of some of these necessary service betterments.

Rural electrification in some sections of the country has forced telephone companies to metallicize their rural lines. In many cases this will make possible phantom circuits into all neighboring exchanges at a small additional cost. There are several methods by which this phantom circuit arrangement may be made possible.

Suppose exchanges "A" and "B" are ten miles apart and both have rural lines metallicized, passing near each other somewhere near the midpoint. Exchange "A" may extend one of its lines into exchange "B." Exchange "B" may also extend a line in a similar manner into exchange "A." This provides two rural lines and, if a phantom circuit is used between the two rural lines, also a special trunk line connecting the two exchanges.

As the four wires will form the phantom group, naturally the physi-

WHEN CORRECTIVE MEASURES may be obtained at such reasonable cost inferior service need not be tolerated in rural districts. Metallicization of rural lines (made necessary by REA construction of electric lines) makes possible additional circuits by phantom arrangements. If properly constructed, phantom circuits are not noisy and give satisfactory transmission. Use of loading coils and repeaters on rural toll leads. Miracles in the realm of transmission performed by modern developments in telephone equipment

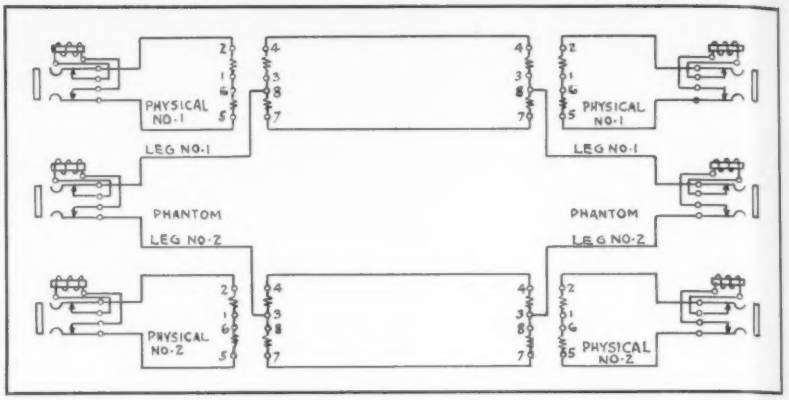
cal circuits and the phantom must be properly transposed, but that is neither difficult nor expensive. The use of transpositions has been discussed from time to time in the pages of TELEPHONY.

When branch lines to farm stations are extra long it may be necessary to connect them to the side circuit of the phantom group through a suitable repeating coil to maintain a satisfactory balance. When repeating coils are used out on the line, they must be sheltered in weatherproof boxes and properly protected from lightning.

Another method which may be used is to extend a metallic rural line, serving subscribers from exchange "A," into exchange "B" and, by the use of repeating coils, connect a grounded phantom to it for trunk line service between the two exchanges.

We have all heard considerable unfavorable comment regarding the use of phantom circuits and the statement that they are generally noisy. This is not necessarily true. The lines should be quiet if properly constructed and transposed. The side circuits of a phantom group should be of good wire and properly spliced. Noisy splices on side circuits cause an unbalanced condition and a noisy phantom circuit.

Copper wire, about No. 12 gage, can be used to advantage for the phantom group, but this is not absolutely necessary. Good iron wire for such short distances is satisfactory in every way. With the new improved compression type sleeves, good splices in either copper or iron wire are easily, quickly and economically made. The line must be well-insulated, which also means keeping it free of trees.



Repeating coil connections for a straight phantom circuit—two metallic circuits and one phantom circuit between exchanges.

When a phantom circuit is noisy, the trouble may often be corrected by connecting a non-inductive potentiometer in the side circuits at each office and adjusting them until the lines become quiet. Special balance coils may also be satisfactorily used for this purpose.

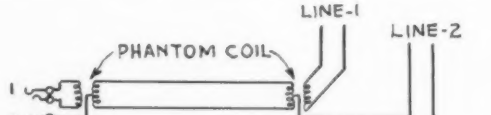
The question may be brought up as to why it might be possible to obtain a good quiet grounded phantom circuit when it was necessary to metallicize the physical circuits to eliminate inductive interference. While it may be true, in some sections where inductive trouble is especially bad, that this will not be possible, ordinarily a satisfactory circuit can easily be obtained.

It is always a good idea, in making the ground connection at each end of the grounded phantom, to connect in the circuit a good non-inductive potentiometer and two cells of dry battery. These potentiometers can then be adjusted until the earth currents balance and the circuit becomes quiet.

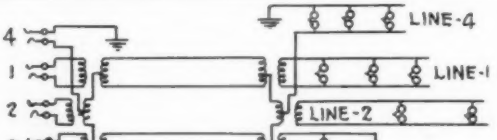
Telephone users of today and the men who provide the service are not ordinarily satisfied with grade of transmission in which speech can merely be heard and understood. Talking pictures and radio have shown the possibilities of fidelity transmission and reproduction of speech, and the same high quality is also now being demanded by telephone users.

Occasionally, the statement is heard that transmission was better in the old open-wire days before we went in for cable in a big way; in many cases this may be a fact. In the beginning, in most exchanges, cable generally extended only a short distance from the central office.

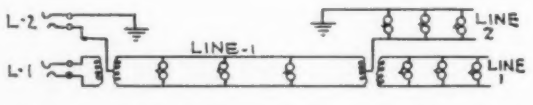
This was later extended to the city limits and recently, in many cases, for some distance into the country to replace heavy open-wire leads. At the present time it is not uncommon for exchanges, miles apart, to be connected with either aerial or underground cable. Toll cables are also extensively used in many sections.



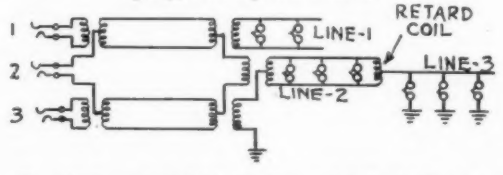
Straight phantom circuit made from two parallel metallic circuits, totalling three circuits.



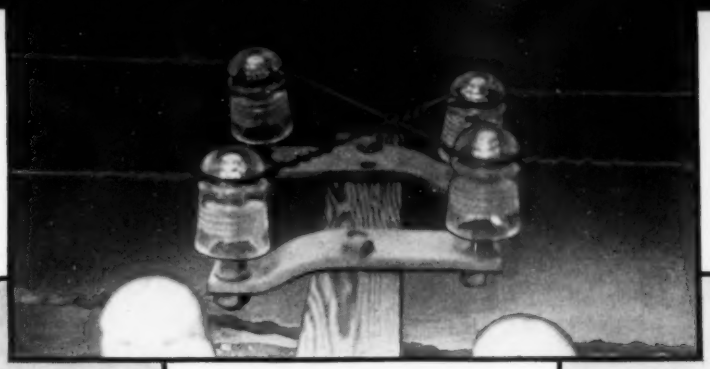
Half phantom circuit superimposed on a straight phantom group, totalling four circuits.



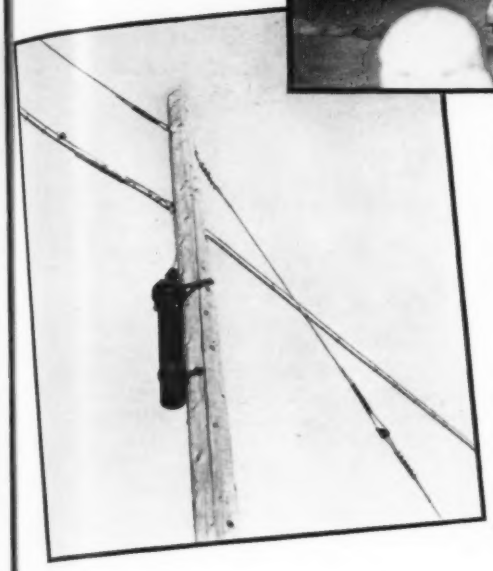
Half or grounded phantom made from one metallic circuit, totalling two circuits.



Combination of straight phantom and half phantom circuits, totalling three circuits.



The above illustration shows the point type transposition bracket.



To the left is a loading coil connected on an aerial cable.

Grounded phantom can be used to advantage on some metallic lines, as shown to the right.

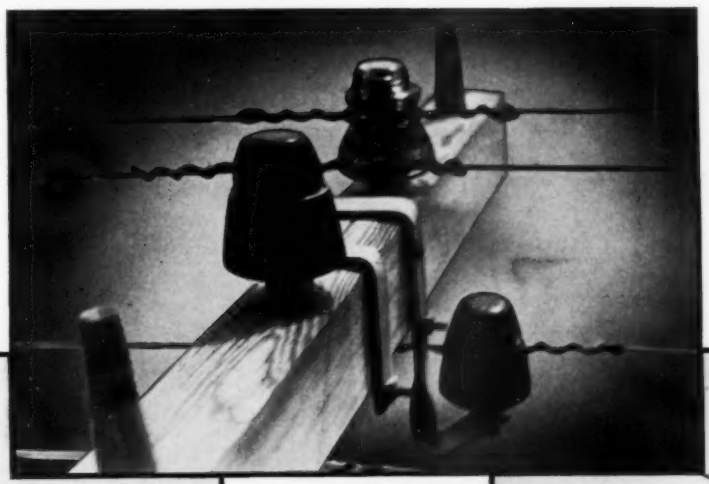
Distortion and transmission loss found in unloaded cable is due to the "mutual capacitance" of the cable itself, each pair of the cable and the dialectric between them forming a condenser across the pair.

This capacity has a tendency to throw the current and potential of the transmitted power "out of phase" and reduces the amount of power at the receiving end. Also, due to the mutual capacitance, the transmission loss increases rapidly with a corresponding increase in frequency until the higher tones of speech may be entirely lost.

The effect of capacitance in a telephone circuit may be neutralized if the circuit also contains sufficient inductance, properly distributed along its length. This is why extreme losses are not encountered when open wire is used. Due to the wires being spaced rather far apart, the distributed capacity is low, and the inductance is so high that its effect is practically neutralized.

Cable has so many worthwhile advantages that its use is being constantly increased. Telephone circuits through cable are gradually being extended greater distances and sometimes to the detriment of good transmission. The open-wire effect of high inductance may be secured in cable by connecting a number of coils, of correct inductance, in series and properly spaced for the length of the circuit.

This practice is referred to as "loading." Load coils are sealed in moisture-proof cases and are mounted either on poles or in manholes. Loading coil



The view below shows a heavy toll and rural cable running miles across the country.

Below is shown an illustration of a cross country toll cable.

The drop bracket type transposition bracket is shown above.

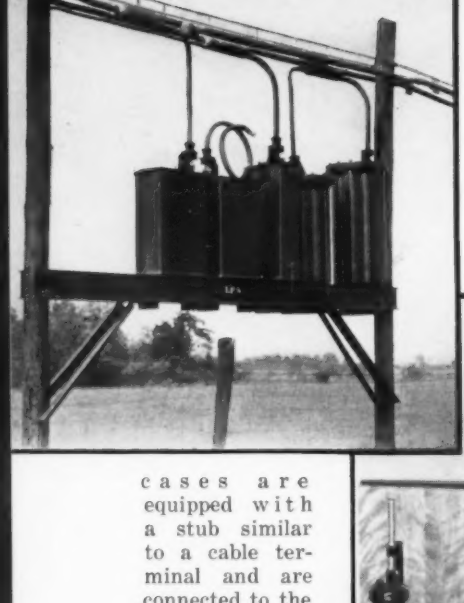
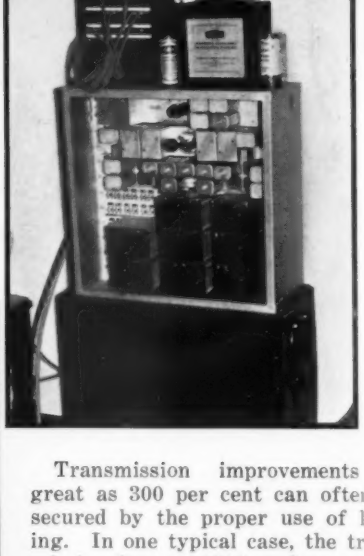


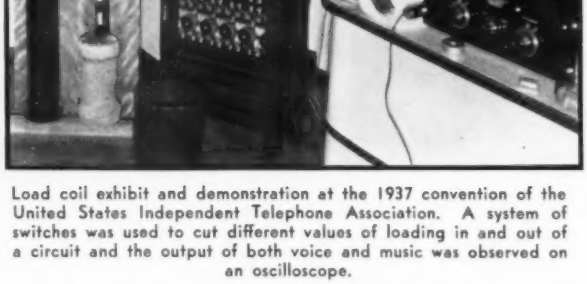
Illustration to the left shows loading coils on a large toll cable.

To the right is a view of the modern telephone repeater displayed at last convention of national association.



cases are equipped with a stub similar to a cable terminal and are connected to the main cable in a similar manner.

The effect of the added inductance of loading causes the current and potential of the transmitted waves to be more closely "in phase" and thereby increases the amount of current received with reduced distortion. The transmitted volume is increased by the added impedance so that a given amount of current is transmitted at a higher potential and, therefore, carries greater energy. Transmitted waves are carried for greater distances through properly - loaded cable with very little loss and distortion.



Load coil exhibit and demonstration at the 1937 convention of the United States Independent Telephone Association. A system of switches was used to cut different values of loading in and out of a circuit and the output of both voice and music was observed on an oscilloscope.

Transmission improvements as great as 300 per cent can often be secured by the proper use of loading. In one typical case, the transmission loss at 1000 cycles was reduced from 0.97 to 0.02 db per mile. A mile of No. 22 gage cable with a mutual capacitance of 0.073 mf. per mile and an attenuation loss in db per mile at 100 cycles of 1.737, was reduced after loading to 0.665 db per mile. The approximate cut-off frequency was 3401. This, it is believed, proves conclusively the advantages to be gained through the proper loading of telephone circuits through cable.

When open wire is to be replaced by cable the proper use of load coils will often permit economy in plant investment. Loading coils will permit the use of cable with smaller conductors and higher mutual ca-

The illustration above shows three phantom transpositions and one physical transposition on one pole.

View to the left shows toll cables running across country.

pacitance, which is less expensive and also smaller in diameter and lighter in weight. Often even better transmission can be obtained with a cheaper loaded cable, than is possible with a more expensive unloaded cable.

An example of this is the transmission loss in a No. 16 gage cable, having 0.062 mf. capacitance per mile, of 0.786 db per mile without loading. On the other hand a No. 22 gage cable of 0.083 mf. capacitance cable, properly loaded, has a transmission loss of only 0.706 db per mile.

A few places where loading may be used to good advantage in the telephone exchange are found in:

Cable circuits for trunk-line service between toll centers, either physical or side phantom circuits. Loading may be used with equal satisfaction on circuits for either ring-down or dial service.

Toll entrance or intermediate cables.

Inter-office trunk cables between exchanges, manual or automatic.

Load coils may also be used to advantage on long cable subscribers' loops. Numerous other applications will be found for load coils in almost any modern telephone exchange.

Anyone interested in improving the transmission of lines should also investigate the modern telephone repeater and its numerous possibilities. Some may feel that a telephone repeater is too complicated or too delicate for their use. Others may not be aware of the fact that thoroughly reliable repeaters may now be procured at most reasonable prices.

The modern repeater is a practical piece of equipment for operating daily over extended periods without tinkering or adjusting. Its design is simple and compact though rugged and serviceable. Any experienced telephone man can easily install and maintain one of these repeaters. One type can be procured which operates from 110-volts, 60-cycle, single-phase, alternating current. Where the a. c. power supply is not reliable, dry batteries for standby use can be procured at a small cost.

The modern telephone repeater has real power. The gain of a single unit will overcome the loss of 157 miles of .104 copper wire, 15.5 miles of No. 19 gage cable or 8.3 miles of No. 22 gage cable. The repeater does more than produce volume; it actually improves the tone of the voice by eliminating noise and distortion developed from other sources.

As mentioned previously, telephone cable offers greater loss to high frequencies and higher tones. For this reason modern repeaters are designed to give a greater amplification of higher tones, which causes the voice to be more lifelike and easily understood. At the same time all frequencies below 160 cycles have been suppressed to eliminate the common source of disturbance from power line induction.

Telephone repeaters are ordinarily of three types: intermediate, terminal and cord circuit.

When an intermediate repeater can be permanently installed in the center of a circuit it presents an almost ideal condition. The repeater may be set for maximum gain and used on all calls over that particular line.

The terminal repeater differs from the intermediate type only in that it is located at one extremity of the line.

The cord circuit repeater is somewhat like an intermediate repeater as it is located near the center of the build-up circuit. On installations of this type, a balanced network is connected in each circuit to be used on the repeater and adjusted to the value of the line and its average terminations at the distant end.

Each end of the repeater will thus be balanced regardless of the line to which it is connected; and its gain is determined by the same rules as though it were permanently connected in each combination of circuits. The cord circuit repeater has the advantage that it may be used on several different lines.

Repeaters may be operated with equal success on either physical or phantom circuits. Phantom groups must be transposed properly to prevent crosstalk, and any intermediate equipment on one physical circuit should be balanced by similar equipment on the other side or by some other satisfactory method. As previously mentioned, however, this precaution is also necessary on non-repeater circuits.

Standard radio tubes are used in the modern telephone repeaters and may be tested with standard equipment found in all radio stores. A repeater operated 24 hours a day will require approximately one new set of tubes each year. No further maintenance is required as none of the other apparatus is subject to deterioration.

A better grade of rural line service can ordinarily be obtained at a smaller cost if advantage is taken of the modern improvements now available. Everyone charged with the proper operation of a telephone system, regardless of its size, would do well to investigate the possibilities of these modern developments, and manufacturers will recommend equipment which will best meet particular needs.

Investigate the possibilities of using phantom circuits in your area. If transmission is low, investigate the possibilities of using loading coils or telephone repeaters. You will be surprised at the low cost by which modern miracles can be performed in this telephone world of ours.

▼ ▼

Responsible for Island's Communication Facilities

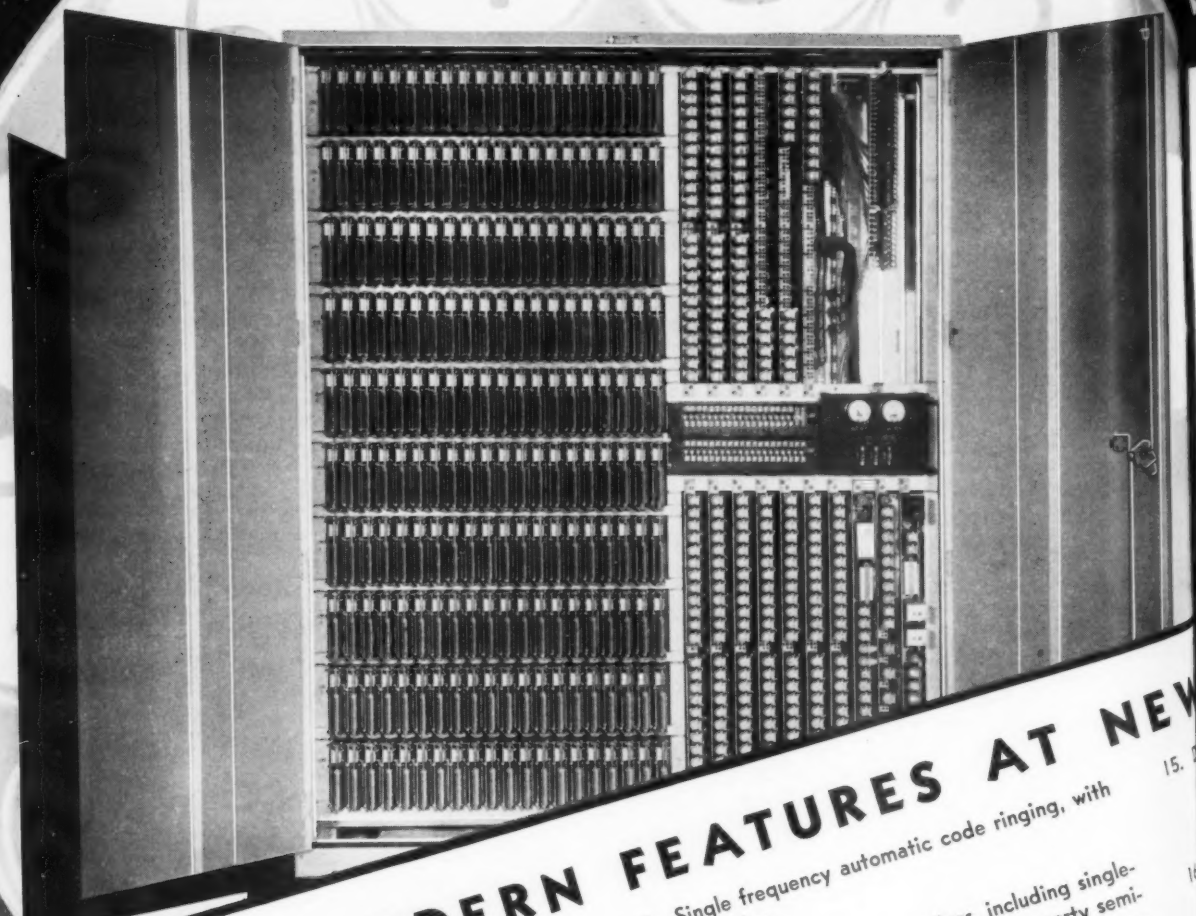
Edward Betts and his wife, Mary—the entire staff of the Pelee Island Municipal Telephone Co.—are responsible for keeping this island in Lake Erie in touch with the mainland and its inhabitants in touch with each other. The illustrated story of this unique telephone exchange was featured recently in the pictorial rotogravure section of the Detroit News.

Pelee—the largest island in Lake Erie and the southernmost bit of Canada—belongs to the province of Ontario. Serving the island and keeping the 700 residents of this community in touch with each other, are some 130 telephones operated by the Pelee Island exchange.

Telephone borrowing is not a problem on Pelee Island, for the operator (Mrs. Betts) recognizes the voice of every subscriber and never fails to collect 10 cents a call from non-subscribers. The peak load is usually during the noon hour, and oftentimes Mrs. Betts and her husband complete as many as 200 calls during the rush period. Most of the time, however, Mrs. Betts is able to handle the traffic, and even find time between calls to do her housework.

Not only does Mr. Betts officiate as extra operator during the peak loads but as relief operator now and then. He is the company's lineman, repairman, service department and bill collector—not to mention the fact he operates a five-watt short wave radio station, installed in his home by the Dominion of Canada as a link between the residents of the island and the mainland. Chief assistant to the radio operator is Mrs. Betts.

As if that is not a big enough program of activities for a man and his wife, Mr. and Mrs. Betts hold weather observer's tickets, Mr. Betts serving as official weather observer for the Pennsylvania-Central Air Lines, the Washington-Detroit flights of which pass over the island.



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The FARMERS Build a Line

End of company's cable and beginning of company-owned portion of the farmers' line, one-half mile from the Millen central office.

TYPICAL of a properly-designed telephone system for a rural area is the system recently built to serve the rural residents in the vicinity of Millen, Ga. Story of construction of this line as related recently in the Southern Telephone News

A FAMILIAR sight on the less-traveled byways is a small pole line with from one to five pairs of wires. Often the motorist pays no attention to these minor bits of the nation's telephone system, although in many respects such telephone lines are of far greater importance to their users than are the city's systems, for the isolation of the average farmer is much greater.

How do these rural telephone lines get there? Who builds, operates, owns them? Who repairs them?

There are various answers to these questions. Sometimes the telephone company owns the lines, sometimes the subscribers own them. This is true of the other questions.

Perhaps the best way to get a glimpse of the picture of farm telephone service is to look at a new system that was recently placed in service out of Millen, Ga.

The line owned and built by the Southern Bell Telephone & Telegraph Co., extends 4½ miles from the Millen central office to the southwest, of which 3½ miles is outside the city limits. No charge was made for the circuits inside the city limits, but a mileage charge is made for the lines outside the city—for the 3½-mile distance.

At the end of the Southern Bell line, the construction was done by the subscribers, and they also maintain the lines. There are four of these lines, as shown on the accompanying map. One line has six subscribers, two lines have four each, and one line has three, making a total of 17 telephone subscribers on the system.

Before the line was built, it was necessary to call on the folks living on the different roads to find out which ones would want the service. Then the lines were planned carefully, in cooperation with the subscribers-to-be. One of the subscribers on each line was selected as manager of the line.

The line, as finally planned, required 23 miles of pole line. The telephone company staked out the line to aid the farmers in placing the poles at proper intervals, in this case about 25 poles to the mile.

The map also shows the distribution of the lines and stations. By dividing the subscribers on four lines, instead of having them all on one line, better telephone service was made possible for the subscribers and better service provided from the company's viewpoint.

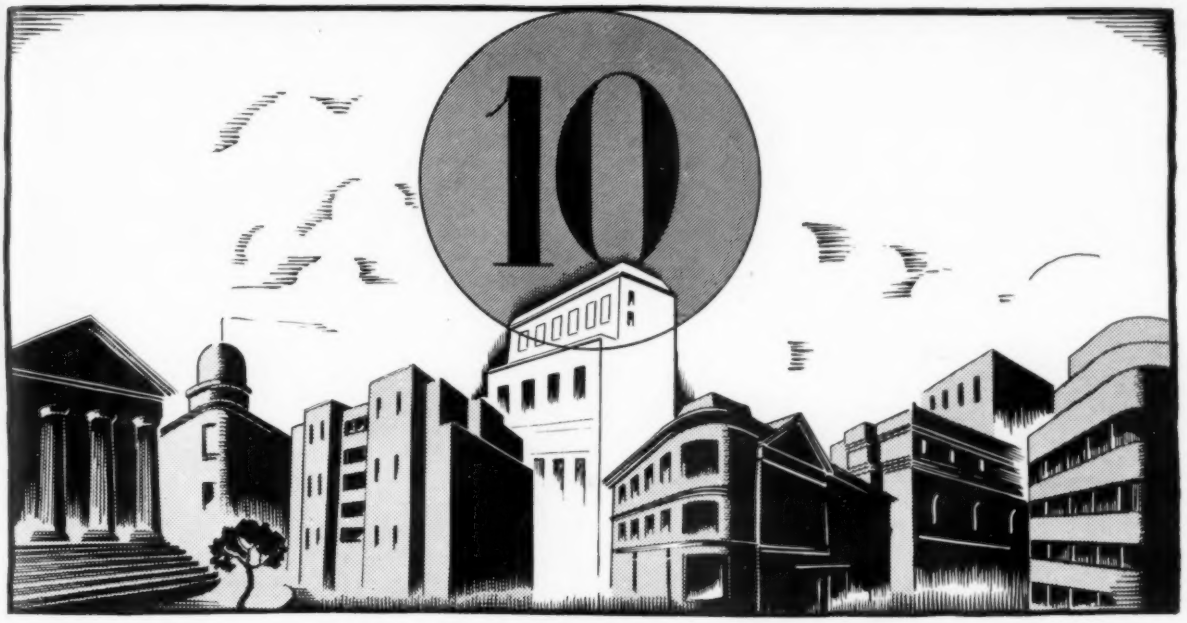
Aid was also given in making out quantity sheets for the necessary wire, brackets, insulators, telephone instruments and other materials used in building the line.

The farmers built the line, setting the poles and stringing the wire with the aid of special tools such as slack blocks, pike poles, sleeve roller and others, loaned without charge by the

View to the right shows end of the company-owned line and beginning of farmers' lines, about four and one-half miles from the central office. One line goes to the left, one to the right and two go straight ahead on one pole line.

The view below shows the swamp traversed by the company-owned line. It looks out from the city limits of Millen.

Below is reproduced a snapshot of one of the customers of the new rural line, who is the operator of this filling station and general store. Another telephone is located in the residence which may be seen in background.



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With such roots firmly established through many years of practical experience it has been possible for Strowger engineers to develop mechanism capable of economically serving 10 or ten thousand telephone subscribers with equal facility. In addition, the same principle and apparatus have been adapted to numerous other services including Automatic Trunk Exchanges, Supervisory systems for Power Networks, Totalisators for wagering, and Street Traffic Signalling.

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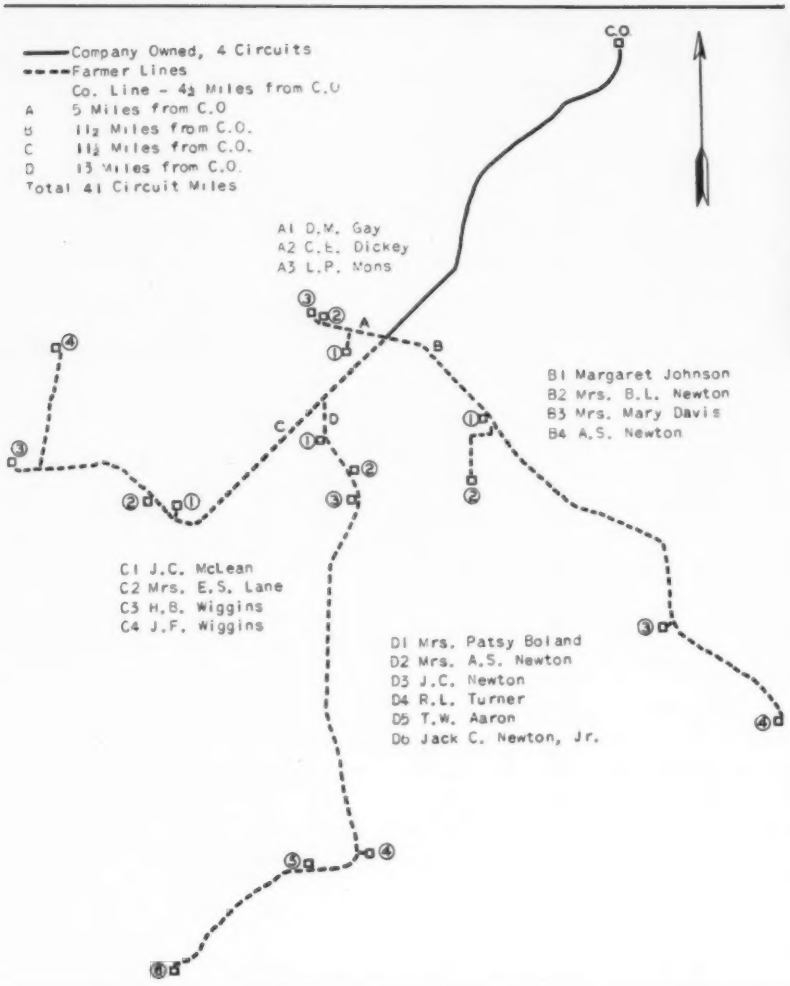


Map showing the direections of the farmer lines and distribution of stations. Connection is made to the company-owned line 3½ miles from the city limits.

A typical wall telephone set used by subscribers to the new rural line. Some subscribers, however, have handsets.

telephone company. However, such steps in construction as pulling slack and cutting transpositions were done by the telephone company's employes, while the telephone instruments were also installed free of charge.

After the lines had been built, a final check-over was made by the Southern Bell manager at Millen, and various defects explained to the farmer-manager of the line.

In one instance a tree limb had to be cut away from the wires. At several points the brackets had been placed too close together, making it likely that a high wind would cross the wires. One pole had to be moved several feet, and so on.

At least once each year, a similar inspection will be made to aid the farmers in keeping their lines in fine condition.

The value of this service on the farm was quickly demonstrated to the new telephone subscribers. One man kept a record of the number of trips to town he had saved during the first 11 days. A round trip to Millen would be 14 miles, and he saved 16 such trips in 11 days.

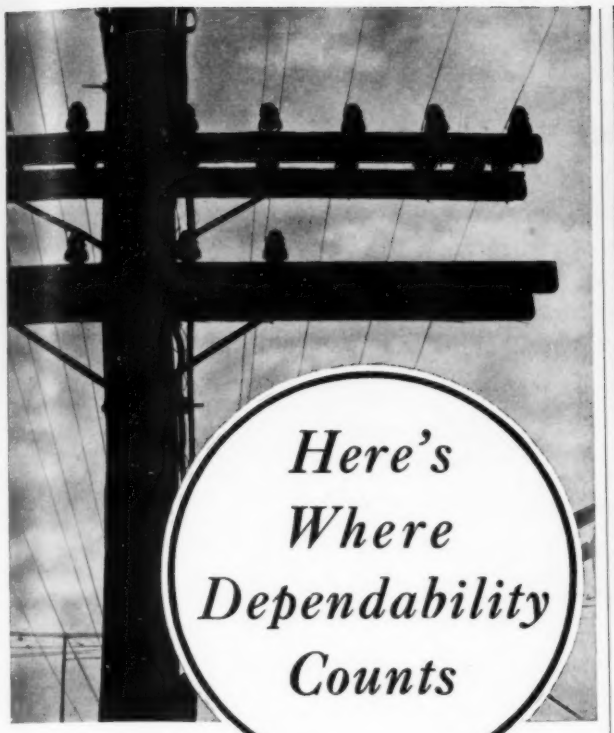
One night a neighbor's daughter became ill, and needed medicine quickly. A telephone call was made to the druggist at his home. Quickly dressing himself, he went to his drug store, filled the prescription, and was waiting when the farmer arrived to call for it, saving considerable time on this occasion.

This same subscriber had another experience which showed the value of his telephone service. On a trip to Savannah, he decided to sell his cotton and so advised a broker. Changing his mind upon reaching his home, he telephoned the broker, just in time to stop the consummation of the sale.

Another subscriber is an agent for electrical equipment. He had a call to make on a prospect 15 miles away, and although tired from a day's work decided to drive over to attempt to close the sale. The filling station operator suggested that he save the gasoline for some other trip, and use his newly-installed telephone.

He telephoned and learned that his prospect had purchased another unit. Although he did not make a sale over his telephone this time, he did save

Some typical farm homes served by the new rural telephone line near Millen, Ga.



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a useless 30-mile drive in the evening.

Another of the subscribers has both a son and a daughter living in Millen, and the telephone provides an ever-ready link for the family.

The availability of long distance telephone service is of considerable importance to these families living in the country, as several of them pointed out. One family includes a daughter who teaches school in South Georgia, and the telephone will bring her home for a voice-visit every Friday night during the school year.

During the first three weeks in which one of these lines was in service, three families used $2.77 in tolls. Most of the calls, of course, are within 50 miles of Millen.

Ordinarily, farmers build their lines to the base rate area or city limits, as the case may be, of the Southern Bell exchange to which they desire connection, where their lines connect to the Bell circuit at the minimum service charge of $3 per month for six customers or less. Connection of more than six parties to such lines is not encouraged by the Southern Bell; but where more than six are connected, each additional subscriber over and above six, pays 50 cents a month for service.

Where existing telephone company facilities permit, farmer's line subscribers may rent from the Southern Bell, as is the case at Millen, Ga., a circuit at a rate of $10 per mile per year to a desired point of connection beyond the base rate area, thus saving the farmer, quite frequently, miles of pole line construction and its future maintenance.

The Southern Bell company extends to the farmers in building their lines all possible help and cooperation. For instance, if they desire, the prospective line is staked out for them; the necessary material is ordered for them from whomever they desire to buy.

The Southern Bell company supervises, free of charge, the construction of the line by a competent plant man to see that the line is properly constructed and, lastly, these lines are inspected once a year, free of charge again, making note of such corrections as are needed and these corrective notes are handed to the manager or secretary of these lines for his information and guidance.

The telephone company hopes in this manner not only to encourage the building of these lines but also to facilitate the proper maintenance thereof, as is essential to continue satisfactory service.

The Operators' Corner

By MRS. MAYME WORKMAN

Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

FRIENDLINESS and cooperation between management and employe results in customer good will. Series No. 319

EVERY COMPANY or business is eager to make friends, for without them no business can flourish or prosper for any length of time. Alert business men and managers appreciate the value of creating a spirit of friendliness between their customers and their company's personnel. They also realize that one disinterested, indifferent or disgruntled employe can destroy and lose more business for the firm than can be secured through extensive advertising or the sincere efforts of the remainder of the personnel.

The following article by B. C. Forbes illustrates why politeness pays:

"The head of a New York department store noted that a new employe was breaking all sales records for her department. He investigated. He discovered that she was a high-born Southern woman in her thirties, formerly in society, but whose financial standing had been badly impaired, and that she greeted customers with a handshake and the same cordiality she had been accustomed to extending to personal friends. Also that women were bringing their friends in to meet her and to be served by her.

"Almost daily she had invitations to have lunch in the store's restaurant. Just a case of politeness, cordiality, friendliness registering.

"Vanity is a basic human trait. Analyze courtesy or politeness and you realize it appeals to us because it entails flattering us by according us consideration, by exhibiting interest in our wishes, our whims. No sales manager, no head of an organization can afford to neglect consistently inculcating into every employe contacting customers the importance of constantly manifesting eagerness to serve customers, even making a fuss over them."

Of course, telephone operators are not in a position to shake hands with their customers, but they can *and should* constantly manifest an eagerness to serve them by conveying a spirit of friendliness through their tone of voice.

Charley Schwab, that wise sage, has said: "Be friends with everybody. When you have friends you will know there is somebody who will stand by you. You know the old saying, that if you have a single enemy you will find him everywhere. It doesn't pay to make enemies. Lead the life that will make you kindly and friendly to every one about you and you will be surprised what a happy life you will live."

True words, indeed! No one can afford to have an enemy in either their social or business relations.

Some employes may say: "Why put forth so much effort to make friends of the company's customers?" The answer is simple: No customers, no company; no company, no job; no job, no pay check.

It is always a pleasure to visit an exchange where peace and harmony and a true spirit of friendliness prevails. Where management and employes work hand in hand.

Where this spirit prevails, management and employes alike will have the goodwill of the customers in their community and when service problems arise, as they do occasionally, these customers will lend their wholehearted cooperation in solving the problem. They will be patient and tolerant, knowing the company and its employes are putting forth their best efforts to correct the difficulty. Verily, friendliness pays.

Questions from Illinois Operators

1. Should the called office follow up our calls to see if they answer or must we call back and ask to have our number rung again?
2. When clearing a circuit is it correct to say, "Release the circuit," if intermediate operator answers?
3. What color ticket is used on messenger calls?
4. If a subscriber disputes overtime and insists he did not talk overtime, what shall we do?
5. In clearing a circuit which has been built up, should the operator ring on the circuit and then cut out or should she ring until the first operator answers and then clear to destination?

The answers to these traffic questions are given on page 48.

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Some Troubles In Small Exchanges

By J. D. KRATZ

Wisconsin Representative, Stromberg-Carlson Telephone Mfg. Co.

GAS RELAY used in ringing circuit for eliminating noise on lines. Experiences given in reducing inductive interference. Testing equipment and methods of locating grounds on rural lines. Talk before annual convention of Wisconsin Locally Owned Telephone Group

A PARTICULAR difficulty of the State Long Distance Co. at Elkhorn, Wis., caused me to become interested in the subject of inductive disturbance on telephone lines. I then recalled a remark made by an engineer, while visiting our factory, concerning a device recently developed to correct this particular condition. This device consists of a gaseous discharge tube equipped with special metal electrodes. These tubes will permit current above a predetermined voltage to flow with a current adequate for ringing telephone bells in the normal manner.

The most important feature of this device is its infinite resistance to the passage of high-frequency current of a potential below its predetermined breakdown voltage, while above this point it instantly functions to pass a current capable of ringing the bells satisfactorily.

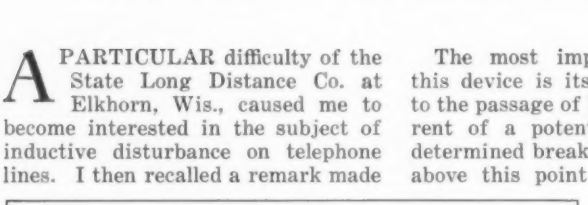

Fig. 1. Insertion of gas relay in ringer circuit eliminated "noise" on rural line having selective ringing.

The telephone company at Elkhorn is using on its rural lines a selective ringing system consisting of positive and negative pulsating ringing current. The normal set-up is to bridge four bells to ground on each side of a metallic line. Each bell bridged to ground naturally causes an unbalanced condition. This arrangement causes an unbalanced condition which makes the line susceptible to inductive interference. The installation of the gaseous discharge tubes on this line eliminated the difficulty.

The method used to connect the gaseous tubes or relays in the bell circuits on a rural line with 8-party, harmonic ringing is indicated in Fig. 1. It will be noted that a relay is connected in each bell circuit on each side of the line. A condenser, also connected in the bell circuit, is not necessary except when machine ringing is used. When machine ringing is used, the condenser is necessary to prevent the flow of tripping battery when the gas in the tube breaks down to pass the ringing current.

It has been noted that much better transmission is obtained on a line where the gas relays are connected in the bell circuits. The bells are actually open to voice frequencies during the talking period. A subscriber near the end of a 20-mile rural line is not forced to talk over the numerous shunts across the line

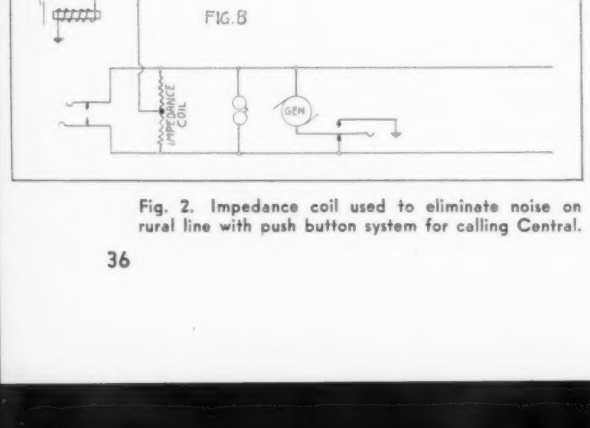

Fig. 2. Impedance coil used to eliminate noise on rural line with push button system for calling Central.

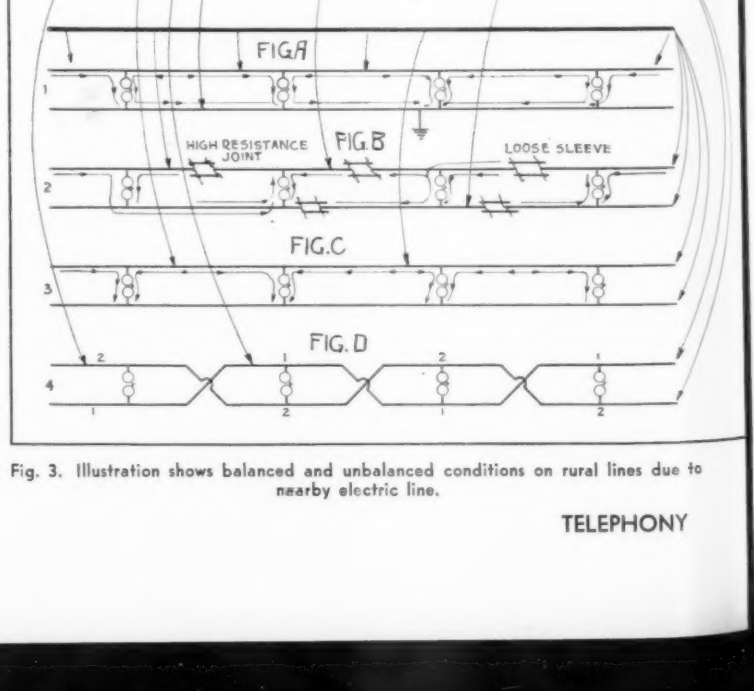

Fig. 3. Illustration shows balanced and unbalanced conditions on rural lines due to nearby electric line.

caused by the other seven subscribers' bells.

Another advantage is that the line is kept clear for testing and for locating grounds and short-circuits. We are all familiar with the difficulty usually experienced in locating trouble with a wire chief's test set, bridge or ohmmeter when we have the resistance of the bells to contend with.

It is not claimed that this device is a "cure all" for inductive interference, and there may be many conditions which it will not correct. It is believed, however, that it is worth a trial and that in most cases it will prove beneficial. An attempt will now be made to describe a few special uses where the gas relay has proved its worth.

On a certain line a push-button system was used in calling the central office. Instead of the bells being grounded, the switchboard line drop was connected to ground until the operator inserted the plug and removed the drop from the line at the jack contacts. When a connection was made through the central office, the line was quiet; but when one subscriber tried to talk to another on the same line, the noise was so intense it was almost impossible for them to hear. A gas relay was connected as indicated in Fig. 2-A, and merely increased the noise.

We then discovered that there was enough induced voltage on each side of the line to break down the gas and cause the tube to glow permanently. A test with an a.c. voltmeter indicated that there was 60-volts alternating current on each side of the line to ground. The difficulty was corrected by bridging an impedance across the line at the switchboard and connecting a center tap of the impedance coil to the grounded switchboard drop as indicated in Fig. 2-B.

This balanced the line and removed the noise, although the current flow through the drop to ground was at all times near the tripping point of the shutter. In two similar cases, where the induced voltage was not so great, the gas relay operated satisfactorily in series with a grounded line drop.

This all resolves itself into the fact that the elimination of inductive interference depends upon several definite factors, which require close cooperation between the power and telephone companies. The latter's job is to maintain a perfectly balanced metallic line; keep it clear of grounds; eliminate all high-resistance splices and transpose properly. It may even be necessary

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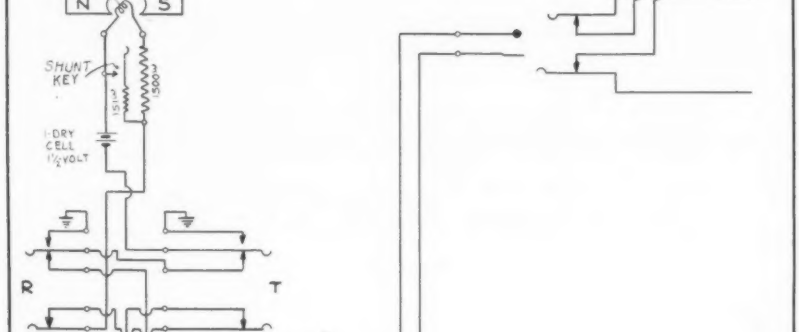

Fig. 4. Circuit connection of homemade testing equipment for locating grounds on rural lines.

to coordinate these transpositions with those of the parallel power line.

All high-tension power lines radiate energy somewhat like a radio antenna. A telephone line (Fig. 3) which runs parallel to a power line absorbs a part of this energy. On a metallic circuit telephone line our problem is to maintain this energy equal on each side of the circuit throughout the length of the parallel.

The instant the current in one side of the line increases above that on the opposite side, it will attempt to equalize itself by flowing through the telephone which is bridged across the line, Fig. 3-C. By transposing the telephone line properly we expose the two wires equally to the induced energy and during a conversation there is practically no flow of current from one side of the line through the telephone to the other, which always causes bothersome noise, Fig. 3-D.

A high-resistance splice causes an unbalanced line and the only equalizing path is through the telephone, Fig. 3-B. When one side of a metallic circuit is grounded the induced current will flow through the telephone to reach the grounded point on the faulty wire, Fig. 3-A.

One of the most important factors in the maintaining of high grade lines in any telephone exchange is some type of sensitive, adequate, testing equipment. This equipment must be sensitive enough to indicate the slight grounds which will unbalance lines subjected to inductive interference.

Testing equipment can always be purchased but for some its cost may be prohibitive. To those who would enjoy building a sensitive ohmmeter a very good foundation meter, with a 0—.001 ampere scale, can be purchased for about $3.50 to $5.00. This meter, when used with a few non-inductive resistances which can be purchased at any radio store at a small cost, can be used to advantage in the telephone exchange.

This set may be arranged with a two-way key with a switchboard cord and plug attached, Fig. 4. The lineman out on the line can request the operator to insert the plug in the jack of the line in trouble and operate the key to its various positions and advise him the readings in each position. The key in normal position will indicate the loop resistance of the line, while the up and down position will indicate a ground on one side or the other.

In locating grounds on a rural metallic line the lineman, before calling the operator from a subscriber's station, places a short-circuit on the line at the instrument. Then the operator is asked to test both sides of the line for grounds. If she gets an equal reading to ground on each side of the line, the trouble is farther out. If the readings are unequal, the ground is towards the exchange. The lineman then removes the short circuit from the line and repeats the tests from the next telephone—either towards the office or away from it, as the operator's test indicates.

Fig. 5-A represents a home-made slide wire bridge for locating grounds. This consists of two lengths of bare german silver resistance wire mounted on a smooth board and calibrated from 0 to 100. The ends at 0 are soldered together and a sensitive headset terminated at the other end. The line to be tested must have a short-circuit placed out at the extreme end. With the aid of a small battery grounded on one side and a feeler wire, the silent point on the slide wire can be located, which will indicate the ratio of the distance of the ground from the end of the line.

Fig. 5-B represents the same method, only using a potentiometer in place of the slide wire and a buzzer with an induction coil for tone.

Fig. 6 represents the method of using the ohmeter for the loop test. A short-circuit, X, must be placed at the end of the line. A reading is taken to ground on both the good wire (850 ohms) and the wire in trouble (350 ohms). The sum of

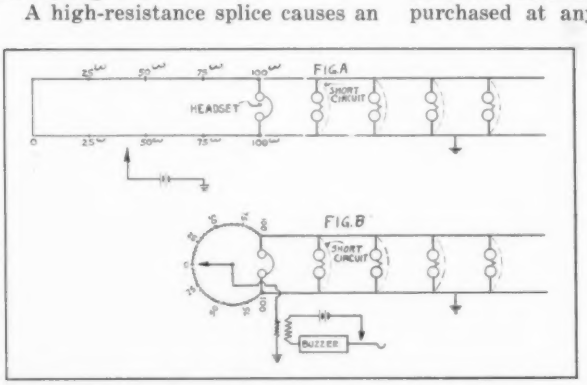

Fig. 5. Simple slide wire bridge and potentiometer for locating grounds on rural telephone lines.

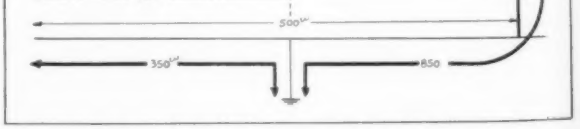

Fig. 6. Illustration of ohmmeter method of making loop test with assumed values of the measurements.

these two readings less the entire loop resistance (1,000 ohms) equals twice the resistance of the ground where it touches the wire. Divide this by two and subtract from the resistance of wire in trouble, and we have exact resistance to the point where the wire is grounded.

This may be expressed as:

$X = B - (A + B - L)/2$, where X = resistance to fault, A = reading to ground on good wire, B = reading to ground on wire in fault, L = loop reading.

Substituting the assumed resistances given in Fig. 6, $X = 350 - (850 + 350 - 1000)/2 = 250$ ohms.

The small ohmmeter carried by many telephone men is of great benefit but is not considered sensitive enough to indicate high-resistance grounds and short-circuits which should be eliminated if lines are to give top service.

▼ ▼

Find Historic Names in Telephone Directory

A novel prize contest was recently held by the Franklin Society, one of America's oldest savings institutions, located in New York City. Prizes were offered through its publication, "The Franklin News," for the best group of 25 listings, taken from the current New York City telephone directory, of namesakes of famous Americans, dead more than 50 years.

The contest elicited the fact that more than 250 namesakes can be found in the New York telephone directory.

The winning list included the names of George Washington, Andrew Jackson, John Adams, John Q. Adams, Ulysses S. Grant, Benjamin Franklin, Nathan Hale, Alexander Hamilton, Henry Clay, Roger Williams, Jonathan Edwards, John Marshall, Patrick Henry, Horace Mann, Betsy Ross, Samuel Morse, John Paul Jones, Mary Lyon, Daniel Boone, Ralph W. Emerson, William C. Bryant, George Peabody, Peter Cooper, Robert E. Lee, and Daniel Webster.

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Cincinnati Bell's Five-Million Construction Plan

In a report made to the stockholders, A. J. Allen, president of the Cincinnati & Suburban Bell Telephone Co. has indicated that the company contemplates a $5,203,000 construction program during 1938.

The report states that a new dial office is being installed at the Avon-University Central office building which will be ready for dial service to subscribers in June. Plans have also been completed for converting the Hemlock-Colonial area to dial service and an addition to the present building begun.

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The Manufacturers' Department

New Vice-President of Automatic Electric Co.

J. G. Crane, for 35 years engaged in the telephone industry, and for 22 years in various executive capacities with the Theodore Gary & Co. group of enterprises, has been elected vice-president of Automatic Electric Co. and vice-chairman of its board of directors of which A. F. Adams is chairman.

A telephone executive of outstanding resourcefulness and energy, based on engineering education and training, Mr. Crane gives to his new duties with the Automatic company a wide background of experience and thorough understanding of operating company problems.

His entire career since graduating from Purdue University with engineering degree in 1903, has been spent in the telephone field. He started as a student apprentice with the Western Electric Co. in Chicago and subsequently served in the switchboard cable and wiring departments, and later as installer and equipment engineer. In 1909 he went to Oklahoma City as superintendent of equipment for the Pioneer Telephone & Telegraph Co., remaining there until 1912 when he

J. G. CRANE, newly-elected vice-president of Automatic Electric Co. and vice-chairman of its board of directors.

was transferred to general headquarters of the Southwestern Bell Telephone Co. in St. Louis, Mo.

Mr. Crane's association with the Theodore Gary & Co. group began in 1915 as general superintendent of the Kansas City Home Telephone Co., together with supervision of other Gary properties in Kansas, Missouri, Texas, and Illinois. In 1920, when the Home and Bell companies in Kansas City were consolidated, Mr. Crane was appointed manager of the merged property and operated it for several years.

In 1925 he became president of the Telephone Bond & Share Co. and for a number of years had active charge of that company and its many operating subdivisions.

As vice-president of Theodore Gary & Co., and of Associated Telephone & Telegraph Co., and also as president of the Anglo Canadian Telephone Co., Mr. Crane is taking an active part in a wide range of activities both in this country and in operating organizations abroad.

In announcing Mr. Crane's election, P. W. Conrad, president of Automatic Electric Co., stressed the increasing importance of manufacturers having at all times a clear understanding of actual and current problems and changes in the operating field. He voiced the belief of the company's directors and officials that Mr. Crane's background brings not only to the manufacturing organization but also to its sales activities—of which J. W. Shipman, vice president, is the active head—values and a viewpoint which will enable the Automatic company to serve the industry with added usefulness and effectiveness.

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Seeger Device Co. Merged With T. J. Cope, Inc.

Announcement is made of the merger of the Seeger Device Co. of Toledo, Ohio, with T. J. Cope, Inc., of Philadelphia, Pa., effective March 1. Adolph M. Seeger, former president of the Seeger Device Co., becomes western manager of T. J. Cope, Inc., with offices in Toledo.

This year T. J. Cope, Inc., is celebrating its 50th anniversary in the field of underground cable installation equipment. Its position in the field is greatly strengthened with the addition of the Seeger products.

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Stromberg-Carlson President Sails for Australia

President Wesley M. Angle of the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., and the Stromberg-Carlson Telephone Co. of Canada, Ltd., of Toronto, Ontario, sailed January 19 with Mrs. Angle from Vancouver, via the S.S. Niagara, enroute to Australia.

WESLEY M. ANGLE, president of the Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., accompanied by Mrs. Angle, is on a business trip to Australia.

In Australia they joined Leslie P. R. Bean, president of Stromberg-Carlson (Australia), Ltd., to inspect the new modern factory completed last year to house the Australian affiliate of the far-flung Stromberg-Carlson telephone interests. The new plant combines the design and manufacturing operations formerly performed by five factories.

The Angles will witness celebrations in connection with the 150th anniversary of the founding of Australia, to which the United States has sent a portion of the fleet.

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Recent Leich Magneto Switchboard Installations

The Leich Sales Corp. announces the installation of a Leich magneto switchboard by the Miller Telephone Service, Fairfield, Idaho. The new switchboard has an ultimate capacity of 100 lines and 12 cord circuits, is equipped with 60 lines and 10 cord circuits. About 150 subscribers are furnished service.

F. C. Miller, owner and manager of the company reports the equipment as providing satisfactory and improved service to subscribers.

The Deep River Mutual Telephone Co., Deep River, Iowa, also recently purchased a Leich magneto switchboard, wired and equipped with 100 lines and 15 cord circuits.

Mrs. Grace C. Phillips is general manager of the company, which serves more than 300 subscribers.

Activities of Commissions and Courts

FCC Bars Merger Talk in Telegraph Hearings

The Federal Communications Commission on February 15 barred from its hearings on the application of major telegraph companies for a 15 per cent increase any discussion of a possible merger between Postal and Western Union companies.

Lee Pressman, representing the American Radio Telegraphists Association, and Percival E. Jackson, representing Postal bondholders, had sought to bring up this possibility.

R. C. Kramer, co-trustee of the Postal Telegraph & Cable Corp., said on the witness stand that "if the telegraph industry is to survive it must have help quickly." He is "not sure" that a 15 per cent increase would entirely solve the industry's problems.

Citing several causes of decreased revenue, Mr. Kramer said that the Black committee's disclosure of telegrams in connection with the utility lobby investigation caused the telegraph industry "a great amount of harm" and caused the diversion of messages to other forms of transmission where " secrecy" could be maintained.

▼ ▼

Handset Rate Ended in 20 States, District of Columbia

The extra monthly charge for handset telephones was eliminated January 1 in 18 states and in the District of Columbia, and was discontinued in Wyoming on February 1, according to information given out by the Federal Communications Commission. The extra handset charge of 15 cents for 18 months will be eliminated in the state of Arizona after March 1.

The growing tendency in the states to reduce or eliminate the handset charge is claimed to be a result of the FCC's recent telephone investigation of the Bell System. During hearings in the inquiry, an exhibit was introduced describing the handset charges and asserting the extra rates had been collected over sufficiently long periods to liquidate the investment of the company in the instruments, at the expense of the subscriber in many states.

In the District of Columbia the extra handset charge had formerly been 15 cents per month for 12 months or $1.50 cash payment. The 18 states eliminating the handset rate are as follows: Connecticut, which formerly charged 15 cents for 36 months; Delaware, formerly 15 cents for 18 months; Idaho, 15 cents for 18 months; Illinois, 15 cents for 24 months; Maine, 15 cents for 36 months; Maryland and Virginia, 15 cents per month for 12 months or $1.50 cash payment.

Massachusetts, 15 cents for 36 months; Michigan, 15 cents for 18 months; New Hampshire, 15 cents for 36 months; New Jersey, 15 cents for 36 months; New York, 10 cents per month without time limitation; Pennsylvania, 15 cents for 24 months; Rhode Island, 15 cents for 36 months; Tennessee, 15 cents without time limitation; Utah, 15 cents for 18 months; Vermont, 15 cents for 36 months; and West Virginia, 15 cents without time limitation.

In many states there were intermediate reductions of the rate before it was ordered abolished January 1. In Wyoming the handset rate was 15 cents for 18 months.

There is a handset rate of 10 cents for 12 months in California and Oregon, both states having had the previous rate of 15 cents per month for 18 months. In Iowa, Nebraska, North Dakota and South Dakota the former handset rate of 15 cents for 36 months is now 10 cents for 18 months.

The 15-cent handset charge for 18 months prevails in the following nine states: Colorado, Kentucky, Montana, Nevada, New Mexico (also West Texas where the Mountain States Telephone & Telegraph Co. operates), North Carolina, Ohio, South Carolina, and Washington. In Colorado, Montana, New Mexico and Washington the handset charge is the same as existed in January 1, 1937, and was not reduced during last year. The handset rate in Ohio was 15 cents for 36 months; in North Carolina and South Carolina, 25 cents for 18 months; and in Kentucky, 25 cents for 36 months.

A charge of 15 cents a month for 24 months was reported at the beginning of 1938 in these eight states: Alabama, Arkansas, Indiana, Kansas, Minnesota, Mississippi, Missouri and Texas. This meant no change in the rate during 1937 in Arkansas, Indiana, Kansas, Missouri and Texas. Alabama and Mississippi previously had a rate of 15 cents without time limitation and Minnesota charged 25 cents for 24 months before the reduction.

Other charges were as follows: Wis-

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consin, 8 cents per month without time limitation, no change in 1937; Georgia and Oklahoma, 15 cents without time limitation, no 1937 change; Louisiana, 25 cents per month for 18 months; and Florida, 15 cents for 24 months, then 5 cents without time limitation compared with 15 cents without time limitation as the charge at the beginning of 1937.

▼ ▼

Wisconsin Assessment on A. T. & T. Toll Revenues

Hearings were commenced in Madison, Wis., February 8, before the Wisconsin Tax Commission on the appeal of the A. T. & T. Co. from an assessment on its operations within the state.

The commission has assessed the A. T. & T. Co. $215,000 for revenue derived from its long distance operations in Wisconsin. The A. T. & T. has accepted the figure as reasonable, but challenges the state's right under the Federal Constitution to tax its revenue, claiming it is engaged in interstate commerce.

Telephone company attorneys contend the A. T. & T.'s long distance operations in Wisconsin are carried on as interstate and not intrastate business and that, therefore, the state cannot tax the company because it is in interstate commerce. The state has maintained Wisconsin long distance operations constitute intrastate business, and make the A. T. & T. subject to state taxation.

Attorneys expect the case to land eventually in the U. S. Supreme Court. It would be the first high court test ever made of the power of a state to tax that part of the revenue from interstate operations of interstate corporations, attributable to the subsidiary companies and equipment they own within the state's borders.

▼ ▼

Rates Readjusted, Based on Concentration of Telephones

An interesting readjustment of rates on the New England Telephone & Telegraph Co.'s system at Tewksbury, Mass., has been ordered effective March 15, involving the consolidation of four "bands," by which mileage charges are computed, into one band, and thus giving a reduction in tariffs to about 45 per cent of the present Tewksbury subscribers now paying mileage charges.

The petitioners complained of the mileage charges and toll charges applicable to Tewksbury customers. This is the second case from this town before the commission, the first having been disposed of in January, 1936.

The Lowell exchange serves Lowell and parts of Chelmsford, Dracut and Tewksbury. Its territory is called the base rate area. Tewksbury does not have a separate exchange, but the greater portion of the town is served from Lowell. The territory of Tewksbury lying outside the base rate area as far as the Shawsheen River, and served by the Lowell exchange, is divided into bands one-quarter of a mile wide. The part of Tewksbury lying southeast of the Shawsheen River and adjacent to Wilmington is included in the Wilmington exchange.

The first band of the Tewksbury territory is adjacent to the Lowell base rate area, and the 14th band which abuts the Wilmington exchange territory is farthest from the Lowell city limits.

Before 1925 these bands, by which the mileage charges of the New England company are computed, were concentric, but it appeared reasonable at about that time that the base rate area of an exchange should be made irregular when the territory adjacent to the base rate area was filled in and the number of subscribers materially increased. In accordance with this practice of the company the Lowell exchange, therefore, serves parts of Tewksbury, Dracut and Chelmsford, and the subscribers living in these towns do not pay a mileage charge, provided they are in the irregular base rate area.

The company furnishes Tewksbury subscribers in the Lowell exchange with one-party, two-party or four-party service, for which the base rate is charged. For those subscribers living outside the base rate area, in addition to the base rate charge a mileage charge is made for each one-quarter mile, as follows:

	Per ¼ mile or fraction
One-party line, auxiliary line, PBX or order turret	$0.70
Two-party line, each main station	0.40
Four-party line, each main station	0.20

There is also a rural line (15 or more parties) about which there is no complaint as no mileage charge is made for this service.

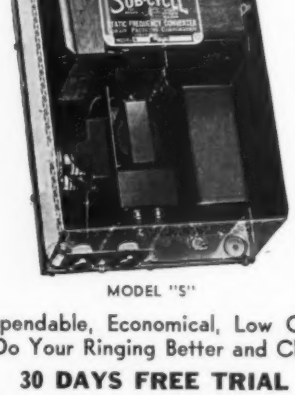
The New England company was willing to set up in the town of Tewksbury a separate exchange which would give service to all subscribers within the town, making a toll charge for these subscribers for calls to the city of Lowell. It appeared at the hearings that this plan was unanimously disapproved because, in general, Tewksbury residents do most of their business in Lowell.

The complaint on the present toll charges to adjoining towns about Tewksbury was that the charge should be five rather than ten cents. It appeared that all calls made to adjoining towns were put through the Lowell exchange and, although the two stations might be near each other by air line, the message actually was transmitted into and out of the exchange in the city of Lowell. Under these circumstances, the commission held that it is reasonable that the charge for this operation should be 10 cents.

In January, 1936, in accordance with the commission's views, the company extended or pushed the base rate area for Lowell one mile into Tewksbury. Before this time all Tewksbury sub-

SUB-CYCLE

The MASTER Ringing Converter



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MODEL "S"

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30 DAYS FREE TRIAL

Output 20 Watts — 90 Volts Operates on 110 Volts A. C.

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Equipped with Pulsator for Biased Ringing, $55.00

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scribers on party lines paid mileage charges.

There was no evidence at the recent hearings, the board stated, that a periodic survey was made by the company to find out if base rate areas should be irregularly extended or pushed farther out from exchanges, which would result in reduced mileage charges. The commission indicates that it would be helpful to all interested parties if such a survey were made at certain and definite periods, and this is recommended in the decision.

At the hearings it also appeared that some of the land on both sides of the main artery running from Lowell to the center of Tewksbury is in swamp land on which it is neither profitable nor healthful to build residences. This naturally prevents a growth in the number of subscribers in this Tewksbury territory adjacent to the Lowell base rate area and precludes, probably, a further extension of the irregular base rate territory. Tewksbury is about six miles long by four miles wide and is practically bisected by Main Street. Its center, about 1.5 miles from the Lowell base rate area, is at the junction of Main, Pleasant, North and East Streets, and it appears that a majority of the subscribers in the town live in the vicinity of this center.

The town center or square is in the sixth band outside the base rate area as drawn up by the telephone company, and the greatest concentration of telephones now paying a mileage charge in Tewksbury exists at the present time in proximity to this section.

A valuation was made by the commission's engineering department of the property of the telephone company in Tewksbury outside the base rate area in order to establish, if possible, a rate base for the mileage charges in this territory. The company claimed that the services set up for the base rate and mileage rate areas overlapped and that the rates for the base rate and mileage rate areas included a charge for the relative value of the services, among other items.

It was also stated that this relative value of the services ran through the entire rate structure of the company (a point vigorously stressed in Massachusetts in the former New England company rate case). The commission stated that it is "not satisfied that any such intangible charge can be successfully defended by a company in any rate case." In the Tewksbury case it has not been necessary to attempt to establish how much weight should be given to such a charge.

"We are of the opinion that, under all the circumstances of this case and having in mind the concentration of telephones in and around the center of the town's square in Tewksbury," states the finding, "and also having in mind the elongated shape of the town, it is reasonable to consolidate the fifth, sixth, seventh and eighth bands into one band, so that the bands now numbered 9, 10, 11, 12, 13 and 14 will be numbered 6, 7, 8, 9, 10 and 11.

"This recognition of the concentration of existing telephones in the center of the town of Tewksbury will give a reduction in rates to approximately 45 per cent of the present subscribers of the telephone company now paying mileage charges in the town of Tewksbury."

▼ ▼

Refund Case Settled; City and State Share

Federal litigation in the refund case of the Illinois Bell Telephone Co. was ended February 5 when the company was ordered to pay the city $37,000 and the state $60,000.

The order was signed by Circuit Judge Evan A. Evans and District Judge James H. Wilkerson.

In the course of the ten-year fight the telephone company was ordered to make a $20,000,000 refund to subscribers. Of that, there remained $1,800,000 in unclaimed money, and both city and state sought to obtain it.

The payments just ordered represented expenses incurred by the city and state in the court fight, and the company is left in possession of the rest of the fund.

▼ ▼

May Levy Occupation Tax on Telephone Companies

With the way paved by a recent decision of the United States Supreme Court, the city council of Los Angeles, Calif., is laying plans to levy an occupation tax on the various telephone companies operating within its wide city limits.

Resolutions were adopted February 9, by unanimous vote, directing the ways and means committee to make a full investigation of this source of income with a view to recommending to the council amendments to the license tax provisions of the municipal code taxing telephone companies doing business within the city limits of Los Angeles at such rates and amounts as to them seem proper.

The resolution points out that new sources of revenue must be found to meet budget requirements of the city because of increasing demands upon the city's financial resources.

Regarding the supreme court ruling, under which it claims the power to impose occupation taxes on telephone

(*Please turn to page* 47)

"Look here, George! What's the idea of another requisition for drop-wire so soon—and what is the meaning of that underscore under the word 'Ironite'?"

"Well, Mr. Martin, if you'd bought Ironite the last two times I requisitioned drop-wire, I wouldn't be ordering more now. That cheap stuff you got for us last winter is giving out already—and we're havin' to replace a lot of it—that's the reason I want Ironite—it'll stand up for years and never gives any trouble. It's the best drop-wire I ever used in all my years of line work."

IRONITE — Genuine Ironite—*is* the best all-purpose drop-wire—and it saves up to $3.00 a thousand feet over copper-clad or bronze.

Here are some of its points—

Conductors are pure iron—heavily galvanized by the "Crapo" process.
Insulation—30% rubber molded and vulcanized to the conductors—white rubber tracer.
Protection — pitch saturated braid, "armorplated" by mica finish impregnation.

Strong as steel
Flexible as a cord
Conductivity on a par with copper
Splices firm as a weld
Insulation as long as installation.

It is difficult to beat IRONITE Prices—
It is impossible to beat IRONITE quality.

Write for latest quantity price quotations on genuine IRONITE

PARAGON ELECTRIC CO.
35 West Van Buren St., CHICAGO

ONLY GENUINE IRONITE CARRIES THIS TAG

Introducing
RTC-2

The New Vincent Rare Gas Relay

For Quiet Transmission On Rural Party Lines

Has lower voltage drop for better ringing with either coded or harmonic bells. Installed with a single screw!

Send for details explaining how the RTC-2 Relay will greatly improve your service at low cost.

L. S. BRACH Mfg. Corp.
Oldest Makers of Rare Gas Lightning Arresters
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CEDAR POLES

Butt-treated or plain, finest quality seasoned Western Red Cedar Poles. Large stocks available for immediate shipment.

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Sandpoint, Idaho

NLRB Hearing on Union Complaint Against Bell

HEARINGS are being held in Milwaukee, Wis., before Examiner James C. Batten of the National Labor Relations Board on charges filed by the Brotherhood of Electrical Workers (AFL) against the Wisconsin Telephone Co.

The charges filed by the AFL union include unfair labor practices, refusal to bargain collectively and fostering of a "company union"—the Independent Union of Telephone Operators.

Employes involved are telephone operators whom the Electrical Workers' Brotherhood has organized into an affiliate union. The Independent union was set up in an effort to thwart the AFL organization, it was charged.

The Electrical Workers' union also is demanding collective bargaining elections among the operators by exchanges, while the company and the Independent union are insisting that, if any elections are held, they be undertaken on a state-wide basis.

The Independent union, it was declared by the AFL, is a direct successor of a former company union, which was reorganized after passage of the Wagner labor relations act.

AFL locals of operators are established in Janesville, Kenosha, Racine, Beloit, Superior and other cities, E. J. Brown, international representative of the union, explained.

The hearings commenced on Monday, February 7, and continued each day through Friday, February 11, when they were adjourned to February 14. The presentation of the labor board case was a little more than half completed on adjournment February 14.

John O'Day, vice-president of the Wisconsin Telephone Co., admitted that the company had given virtual recognition to the Independent union despite advice from N. S. Clark, regional director of the labor board, that it recognize no union while a conflict was pending.

Jenny Daveni, senior supervisor of the Superior exchange of the Wisconsin company, testified that Murray Calhoun, exchange manager, loaned her money for two Milwaukee trips to attend meetings of the Independent unions in November and December. She paid back the loan after being reimbursed by the union.

After the Wagner act was signed, Mrs. Alice Randall, once chairman of the employes' council, and now chairman of the Superior AFL local, testified the company said it could no longer legally finance the representation plan, but started collecting dues of 10 cents a month from employes. Then, after J. E. Bonell, district traffic manager at Eau Claire, told her the plan was illegal, there was talk of an independent union. Mr. Bonell, however, said the company was prohibited from giving employes any advice on unions.

Mrs. Randall and three other employes, learning of the formation of an independent group in Milwaukee, began circulating membership cards, but many of the girls, she said, called it a "phony" union.

Ruth Snow, financial secretary of the Superior unit of the AFL switchboard operators' union, testified on February 11 that Florence Nicholson, chief operator at the Superior exchange, told operators there they were "talking yourselves out of a job" when they discussed the AFL.

Miss Snow, questioned by Frederick Mett, NLRB attorney, said Miss Nicholson also warned her not to take her union financial books into the company's plant, but that she did, collecting dues while off duty.

Dorothy Tracy, president of the Kenosha AFL unit, testified that, when an agreement was sought there, company officials asserted they couldn't consider the unit anything but a grievance committee. She and Mrs. Gladys I. Miller of the Superior unit said they considered local units better able to deal with their own problems than a statewide organization.

The proceedings on February 11 were marked by a clash between George H. Burns, Independent union counsel, and Examiner James C. Batten, who informed the attorney the financial or other practices of the AFL union were irrelevant, adding: "It is not the AFL union, but the Independent union that is on trial."

Mr. Burns declared he had asked about dues simply to show the Independent union's practices conformed to those of other "accepted" organizations.

During the week hearings were twice adjourned due to composure of women witnesses breaking down when they took the stand. On February 8, Miss Jenny Daveni, Superior, member of the Independent union's executive board, burst into tears and the hearing was adjourned. On February 10, Mrs. Della Pasell, vice-president of the Superior unit of the AFL Electrical Workers' union, asked James C. Batten, labor

COMING CONVENTIONS

Texas Telephone Association, Adolphus Hotel, Dallas, March 23, 24 and 25.

Oklahoma Telephone Association, Huckins Hotel, Oklahoma City, March 29 and 30.

Missouri Telephone Association, Hotel Muehlebach, Kansas City, April 4 and 5.

Iowa Independent Telephone Association, Fort Des Moines Hotel, Des Moines, April 12, 13 and 14.

Nebraska Telephone Association, Hotel Paxton, Omaha, April 19 and 20.

Kansas Telephone Association, Hotel Kansan, Topeka, April 27 and 28.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, May 3, 4 and 5.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 11 and 12.

Wisconsin State Telephone Association and Wisconsin Locally Owned Telephone Group, Park Hotel, Madison, May 17-19.

Pennsylvania State Telephone & Traffic Association, Yorktowne Hotel, York, June 2, 3 and 4.

New York State Telephone Association, Seneca Hotel, Rochester, June 7, 8 and 9.

The Illinois Telephone Association, Hotel Pere Marquette, Peoria, September 21, 22 and 23.

board examiner, to declare a recess to enable her to regain her composure. When she resumed the stand after 10 minutes, she seemed so unstrung that Examiner Batten adjourned the hearing until the next day.

On Monday, February 14, Fred D. Pfeiffer of the labor union at Parker Pen Co., Janesville, testified he was a member of the AFL telephone operators' bargaining committee there last summer, and that the Janesville exchange manager asserted it was impossible for the company to reach an agreement except on a statewide basis.

Mr. Pfeiffer said he talked to Mrs. Helen Kissane of Madison, a district representative of the old employes' representation plan who was organizing for the Independent union in Janesville. She told him, he said, that F. E. Chandler of Milwaukee, telephone company general traffic manager, had assured her the Independent union "would get 100 per cent support" from the management.

Dorothy Tracy of the Kenosha AFL local, testified 21 of the 24 operators there belong to the AFL. Margery Spade, president of the AFL local at Janesville, testified 45 of 51 operators there belong to her union.

Contesting a company assertion employes are interchangeable in positions in different parts of the state, she said when she was transferred to Milwaukee as a toll operator she required 24 days' spacial training.

Mrs. Arbutus Rausch of Milwaukee, an operator laid off by the company, testified representatives of the Independent union solicited her membership on company time and property.

Assemblyman Andrew J. Biemiller, an AFL organizer, on February 15 testified he believed members of the local units of the Electrical Workers' Union (AFL) were in a better position for collective bargaining purposes than members of the Independent union. They were able, he added, to present their own local problems, which varied in different communities, and had state and national AFL groups ready to back their demands.

In the case of the Independent union, he testified, if a state-wide referendum were held on any issue, the Milwaukee and Madison employes could "swamp" those in the rest of the state.

E. J. Brown, international organizer for the Electrical Workers' Union, testified along similar lines.

▼ ▼

Construction Work Planned for Indianapolis

Officials of the Indiana Bell Telephone Co. have announced tentative plans for the expenditure of approximately $750,000 on new construction work in Indianapolis, including new inside and outside plant projects.

The major part of the new construction expenditures contemplated will go for trunk lines to new equipment in other exchanges made necessary by the construction last year of the new Broadway exchange at 5870 College avenue in the city.

▼ ▼

Recent Prices in the Metal Markets

New York., N. Y., February 14: Copper steady; electrolytic spot and future, 10.00; export, 9.62½. Tin steady; spot and nearby, 40.62½; future, 40.75. Lead steady; spot, New York, 4.50@55; East St. Louis, 4.35. Zinc steady; East St. Louis, spot and future, 4.75. Iron, N.2 f.o.b. eastern Pennsylvania, 25.00; Buffalo, 24.00; Alabama, 20.00. Aluminum, virgin, 99 per cent, 20.00. Antimony, spot 15.75. Quicksilver, 79.00. Patinum, pure nom. Wolframite, 24.00 nom.

SANDS

THE TYPE 12 SUB-STATION PROTECTOR

This popular type of indoor protector consists of two blocks of porcelain—the line end being equipped with fuse clips only while the other end has fuse clips, ground connection and a well for the discharge blocks. Regularly equipped with seven-ampere, fiber-type fuses with nutted ends, and Type 2105 discharge blocks. Write for further information regarding this and other Sands protective devices.

SANDS PROTECTION EQUIPMENT
is made by:

AUTOMATIC ELECTRIC COMPANY

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1033 West Van Buren Street, Chicago

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Chicago

"Telephony's" Engineering Data

By B. C. BURDEN

Index, General.
Feb. 19, 1938.
No. 43-A, Page 128.

Theory and Practice of the Magneto Telephone Exchange—(Ctd.)

In some instances double-arming is used on "H" structures, although generally this is not necessary. A modified type of "H" structure, sometimes called an A fixture, is shown in Fig. 118. This type of structure is not as widely used as the "H" type as it is generally conceded that it does not offer as much strength as the former type.

The X Brace Structure

A new type of structure is that known as the *X Braced*

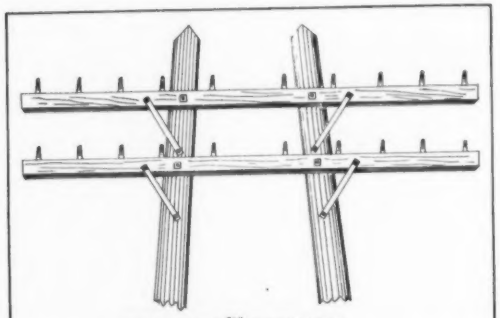

FIG. 118 THE "A" STRUCTURE.

PATENTED SEAMLESS TUBING COIL GENERATOR
IMPROVED ONE PIECE BURNER
PATENTED ARRANGEMENT FOR DISLODGING COIL WITHOUT TEARING DOWN FURNACE
HAND HOLD FOR CLEANER ONE TURN CLEANS ORIFICE
AUTOMATIC ORIFICE CLEANER
AUTOMATIC PUMP INSIDE TANK
16 GAUGE STEEL TANK WELDED BOTTOM

Gasoline **UNIQUE FURNACE** Kerosene

Designed for Public Utilities to withstand the abuse of splicing service! A fast heater — 50 lbs. solder melted in 10 minutes. BUT MORE IMPORTANT — the length of time it will remain in the field free from trouble usually experienced with the average furnace will surprise the old timer. Try a kerosene furnace which will subsequently prove to be better — require less attention—than the best gasoline furnace you ever used.

No. 55 Kerosene, $14.96
No. 53 Gasoline, $13.60
Complete with shield.

UNIQUE MFG. CO., Inc. **221 Whiting St., Chicago**

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Feb. 19, 1938.
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H Structure. This type employs wooden braces placed just below the bottom crossarm of an H frame and arranged in the form of an X as shown in Fig. 119. The X brace acts both as a compression and tension member. Tests indicate these braces to be fully as effective as side guys.

The braces are made from 3⅜-inch by 4⅜-inch straight - grained fir. The ends of the braces are equipped with special galvanized fittings which are bolted to the pole with ⅞-inch through bolts. A galvanized clamp is placed at the intersection of the two braces to hold them firmly together; thus increasing the rigidity of structure.

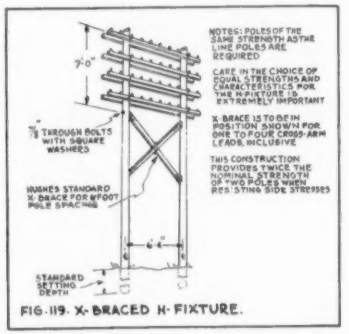

NOTES: POLES OF THE SAME STRENGTH AS THE LINE POLES ARE REQUIRED
CARE IN THE CHOICE OF EQUAL STRENGTHS AND CHARACTERISTICS FOR THE H-PICTURE IS EXTREMELY IMPORTANT
X-BRACE IS TO BE IN POSITION SHOWN FOR ONE TO FOUR CROSS-ARM LEADS, INCLUSIVE
THIS CONSTRUCTION PROVIDES TWICE THE NOMINAL STRENGTH OF TWO POLES WHEN RESISTING SIDE STRESSES
7'0"
⅞ THROUGH BOLTS WITH SQUARE WASHERS
HUGHES STANDARD X-BRACE FOR 9'0" POLE SPACING
STANDARD SETTING DEPTH

FIG. 119. X-BRACED H-FIXTURE.

The principal advantage of the X brace is the elimination of side guys. This is a substantial advantage, particularly in connection with rounded curves where the poles are set on the property line and where permission to set side guys on private property cannot be obtained.

Telephone wires must be transposed in order to minimize crosstalk between the various circuits on a lead and also

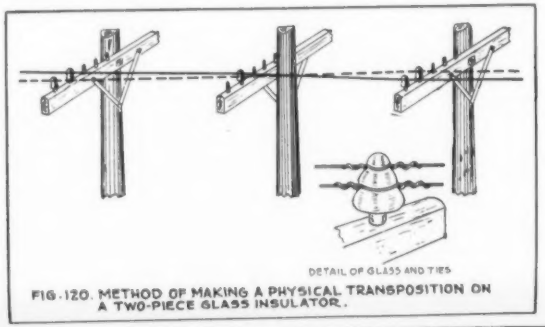


FIG. 120. METHOD OF MAKING A PHYSICAL TRANSPOSITION ON A TWO-PIECE GLASS INSULATOR.

"Telephony's" Engineering Data

By B. C. BURDEN

Index, General.
Feb. 19, 1938.
No. 43-A, Page 130.

to equalize the noise voltages induced from external power circuits. There are two types of telephone transpositions. One, known as a *physical transposition,* involves the interchange of pin positions of the two wires of a telephone circuit. The other, the *phantom transposition,* involves the interchange of pin positions of the two circuits of the phantom group as well as the change in relative position of the two wires of each pair. There are four types of phantom transpositions.

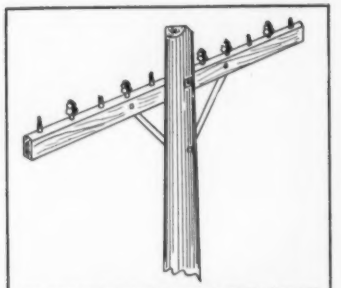


FIG. 121. LOCATION OF TRANSPOSITION GLASS INSULATORS FOR PHYSICAL TRANSPOSITIONS ON TEN-WIRE LEAD.

The simplest method of making physical transposition is by means of a two-piece glass arranged on the crossarm as shown in Fig. 120. Where this method is used the regular wood pin must be replaced with a 9-inch pin in order to accommodate the larger insulator. Fig. 121 illustrates how the two-piece glass insulator would be located on the various pins of a ten-pin crossarm.

On important toll or exchange circuits, instead of using a two-piece glass insulator the 9-inch pin method of transposing physical circuits, iron brackets which are clamped to the crossarm and which drop one of the insulators below the crossarm, are used. Fig. 122 illustrates how these brackets are mounted for circuits on ten-pin crossarm.

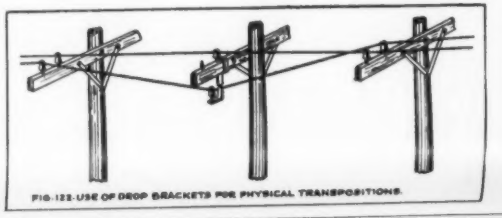


FIG. 122. USE OF DROP BRACKETS FOR PHYSICAL TRANSPOSITIONS.

COURT AND COMMISSION ACTIVITIES

(*Continued from page* 43)

companies, the resolution states that the court has upheld the validity of an occupation tax levied by the state of Washington against telephone companies measured by a percentage of gross income of their intrastate business at three per cent.

Telephone company officials, while declining to be quoted, declare if this tax is adopted it will be the entering wedge for cities throughout the country that are desperately seeking new sources of tax revenue and that it may cause a drastic change in the financial set-up of many companies.

▼ ▼

Indiana to Hear Pleas for Reduced Rates

The first of a series of hearings on telephone rates in Indiana cities has been set by the Indiana Public Service Commission for March 15 in the petition of South Bend and Mishawaka citizens for reduced rates. Files of the commission show similar petitions from Indianapolis, Auburn, Huntington, Martinsville, Marion, Anderson, Albany and Selma.

▼ ▼

Michigan Bell Extends Its Base Rate Area

The Michigan Public Utilities Commission on February 1 approved the petition of the Michigan Bell Telephone Co. for extension of base rate areas surrounding the cities of Pontiac, Lansing, Ann Arbor and Monroe.

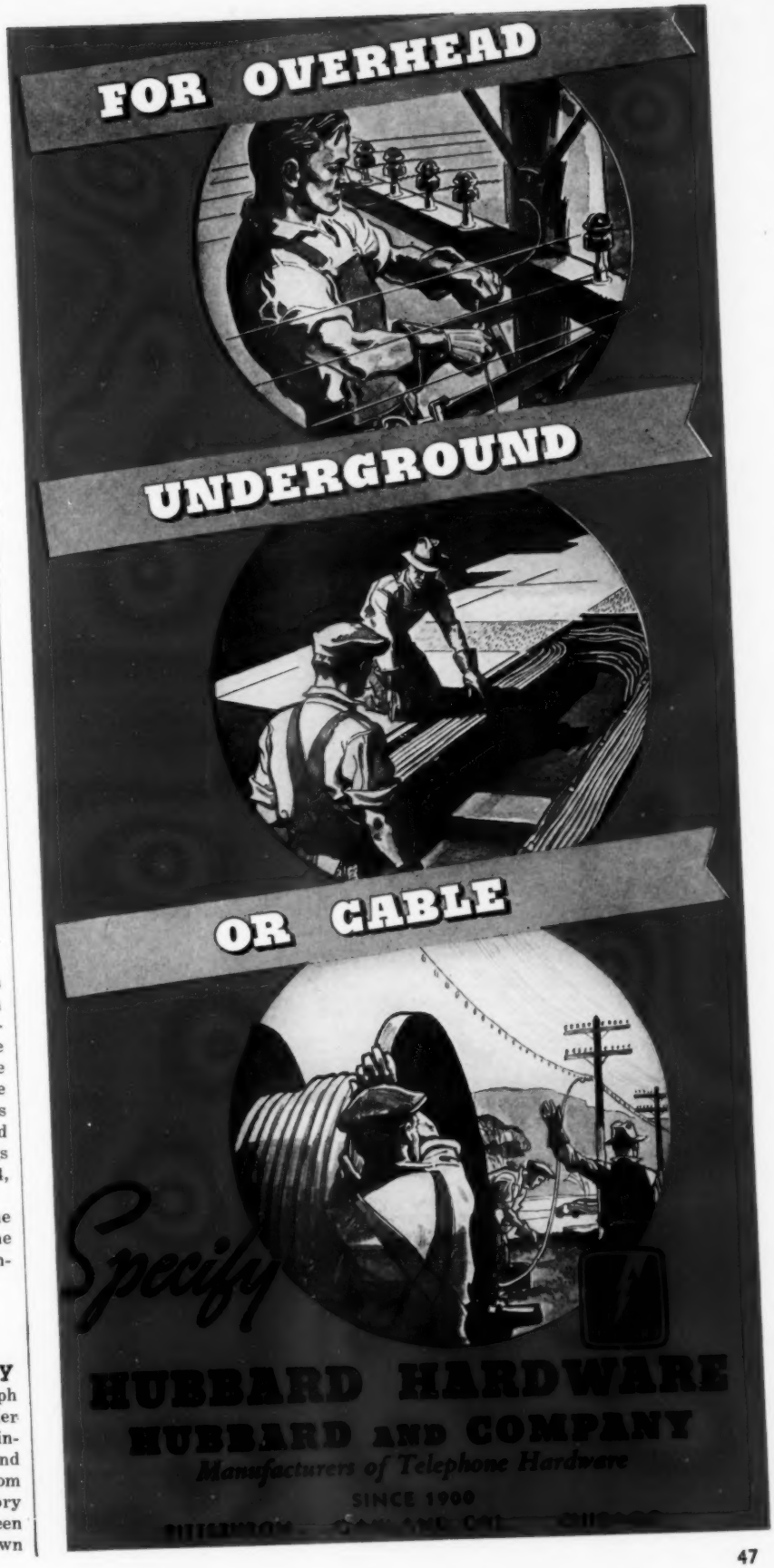
The plan will reduce telephone costs to subscribers who have been paying on a mileage basis, eliminating the mileage charges for those living within the extended areas and reducing the charges for those living just outside those areas. Estimated annual savings to the four communities are placed at $3,460, of which Pontiac's savings will be about $2,258, Ann Arbor's $534, Monroe's $330, and Lansing's $270.

Further conference was held on the reduction of suburban toll rates in the Detroit area and an adjustment of intrastate long distance toll rates.

▼ ▼

Restrain Sale of Alleged Illegal Directory

The Lincoln Telephone & Telegraph Co., Lincoln, Neb., has secured an order in the district court at Lincoln restraining Martha Edwards, D. F. Liffee and two others, real names unknown, from attempting to sell a numerical directory alleged by the company to have been made up from data contained in its own



directory publication. It says that the contents of the company directory are copyrighted, and that to use any part of the information contained therein is illegal. An early hearing will be held.

"Experience with such directories in the past," said H. F. McCulla, general commercial superintendent, "has proved them inaccurate and unreliable due to errors in the listing of numbers. This results in annoyance to subscribers, and in delays and interruptions of service, with the causes outside the control or knowledge of the company.

"Due to the constant change of subscriber listings these people assuming to issue a directory are without accurate information as of the date of compilation of their directory, without which they could not possibly furnish or service a telephone directory."

Mr. McCulla said that company attention to the enterprise was called by business men who had been solicited by the parties named in the suit. No authority or permission had been given by the company.

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Service Improvements for Chester, Neb.

I. C. Steele, head of the Chester (Neb.) Telephone Co., who lives in Ohiowa and operates an undertaking parlor, has made his peace with the members of the local community club at Chester. The club, through its president, L. C. Soldan, had complained of inadequacy of equipment and service.

Hugh W. Cargo, engineer of the Nebraska State Railway Commission, looked over the properties and reported that the switchboard needs repairing, town and farm pole lines should be replaced in part, and a general overhauling of instruments and miscellaneous equipment is required to meet good service demands.

Mr. Steele agreed to follow these recommendations if allowed sufficient time to spread the expense and it was stipulated by all parties to the case that he be given six months. The commission said it would withhold an order until that period had expired.

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Director of Wisconsin Public Service Commission

Calmer Browy, of Madison, acting director of the Wisconsin Public Service Commission, was appointed director February 3, by Commissioners Fred S. Hunt, Robert A. Nixon and R. Floyd Green.

The new director, whose appointment was made effective immediately, has been acting director since October 20, following resignation of William Dinneen, former commission secretary.

Under the 1937 reorganization act the secretary's office was abolished October 16 and was displaced by the position of director, paying the same salary of $4,800 a year.

Mr. Browy joined the commission staff four years ago after three years as capitol reporter on the Capital Times. Starting February 1, 1934, as information director, he became an examiner in the utilities division in May, 1935.

As an examiner, Mr. Browy conducted hearings in telephone, gas and water utility cases, making recommendations to the commission.

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New Problem Before Nebraska Commission

The Lincoln Telephone & Telegraph Co., Lincoln, Neb., informs the Nebraska State Railway Commission, in answering a complaint filed by the Farmers Mutual Telephone Co., of Clatonia, that it owes no statutory duty to furnish switching service to a subscriber of the mutual company who has removed to town and whose telephone is still connected with one of its lines which passes through the town. The situation is entirely new to the commission.

The Lincoln company operates an exchange at Clatonia, where it gives local

Answers to Traffic Questions on Page 34

1. The distant operator should ring the called number repeatedly for one minute, if necessary, and then if the called station has not answered, should pass you a report of "DA."
   If the distant operator fails to pass you a "don't answer" report at the end of a minute and a half from the time you passed the call, reach the distant operator and say, "Is the number DA?"
2. The correct phrase to be used for this condition is "Clear this circuit."
3. The operator at the originating toll center records the call on a white OUT toll ticket. The operator at the terminating toll center records the details of the call on a yellow IN toll ticket.
4. Refer the call to your supervisor or chief operator. She will determine the facts in connection with the call and if the subscriber's claim is correct will make the necessary adjustment of the charge and ticket entries. If the supervisor or chief operator finds that the subscriber's claim is not correct she will refer him to the employe locally designated to handle cases of this nature.
5. On a built-up circuit call it is necessary to give a verbal clearance, saying, "Clear to (distant toll center)." However, if the toll circuit is connected to a ringdown trunk at the terminating toll center, say: "Clear to (called place)."

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T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

H. Sigalet & Company, Ltd., Lumby, B. C., Canada—Western Red Cedar Poles. Plain or butt-treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

service to a number of its own subscribers. The mutual company has no exchange of its own but has been paying 75 cents a month for each of its subscribers given town connection by switching. The Lincoln company says that the local company, whose property it purchased, furnished the type of service demanded in the complaint, but as each subscriber thus favored dropped out no renewal of the privilege was given. At the present time only two subscribers, both women, are thus served.

It asks that they be brought into the case as parties and that an order finally issue that all persons served within the town rate base area must take service from the local exchange it operates. This is necessary to avoid discriminatory rates to patrons within the area.

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Files Complaint Against Microphone "Snooping"

Lee Wells, an attorney of Omaha, Neb., who had previously filed three complaints against the Northwestern Bell Telephone Co., has supplemented his endeavors by filing a complaint that in the inkwells on the desks of 30 members of the official staff in the headquarters building microphones are installed.

When a subscriber registers a verbal complaint with any officer, Mr. Wells claims the conversation is conveyed to what he says is "a snooping department," and there presumably recorded. He says that this is against public policy and un-American, and asks the commission to issue an order that the company cease and desist from such practices.

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Summary of Commission Rulings and Hearings

Federal Communications Commission, Washington, D. C.

January 11: In regard to complaint of Labo & Co. against the American Telephone & Telegraph Co., the FCC held that complainant's allegation—that charges now in effect pursuant to contract with defendant for private line Morse service between New York and Havana, Cuba, constitute unjust discrimination against complainant in violation of Section 202(a) of the Communications Act—was not sustained by the record and therefore no basis for reparations is shown.

February 2: Report released by Chief Examiner Davis G. Arnold recommended that the Tri-County Telephone Co., South Haven, Mich., be classified as a connecting carrier as contemplated by Section 2(b) (2) of the Communications Act of 1934.

February 28: Hearing in Washington before examiner on the application of the Oklahoma-Arkansas Telephone Co., Poteau, Okla., for restoration of toll connections with its line at Fort Smith, Ark., by the Southwestern Bell Telephone Co.

Illinois Commerce Commission

February 16: Continued hearing in Chicago on complaint of William T. Dickerman against the Illinois Bell Telephone Co. as to charges, rates and time limitations for use of the telephone in Chicago. Petition filed by complainant for an order on respondent to produce evidence on hearings.

Indiana Public Service Commission

March 15: Hearing in Indianapolis concerning telephone rates of the Indiana Bell Telephone Co. in South Bend and Mishawaka.

Michigan Public Utilities Commission

February 1: Order issued approving petition of the Michigan Bell Telephone Co. for extension of base rate areas surrounding the cities of Pontiac, Lansing, Ann Arbor and Monroe.

Missouri Public Service Commission

February 10: Joint application filed by R. C. Reeder to sell and Glyn Dowler to purchase the Summersville Telephone Co.

February 21: Hearing in Jefferson City in the matter of an investigation of the billing practices of the electric, gas, steam heat, telephone, telegraph and water utilities operating in Missouri.

Nebraska State Railway Commission

February 9: In the matter of the complaint of Community Club against Chester Telephone Co. and referring to character of service given, ordered that consideration of the matter be deferred six months, at request of all parties.

February 9: Application filed by the Firth Telephone Co. for authority to increase party farm rates from $10 to $12 a year.

February 10: In the matter of the complaint filed by Clatonia Telephone Co. against the Lincoln Telephone & Telegraph Co. alleging refusal of switching service to town subscriber; answer filed setting up that defendant company owes no legal duty to do what is asked it be ordered to do.

February 10: In the matter of application of the Lincoln Telephone & Telegraph Co. for authority to remove exchanges at Nebraska City, David City, Stromsburg and Fairbury from list of exceptions which will automatically place them under the general rule; found reasonable and granted as asked.

February 10: In the matter of the application of the Farmers Mutual Telephone Co. of Avoca, to reduce rates on all classifications of service 20 cents; held to be reasonable and granted as requested.

Ohio Public Utilities Commission

February 9: Approval given application of the Northern Ohio Telephone Co. for authority to purchase all outstanding shares of stock of the following corporations:

Seventy-four shares of $100 common stock of the Kelley Island & Sandusky Cable Co. for $15,069.49.

Six hundred shares of 6 per cent, $100 common stock of the Summit Telephone Co. for $60,000.

Six hundred and thirty-five shares of $100 common stock of the Summit Telephone Co. for $16,002.

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